TOSHIBA

FILE NO. A05-006

SERVICE MANUAL

SUPER

SUPER MODULAR MULTI

HFC

R410A

<Slim Duct Type>

MMD-AP0071SPH (-C, -K),
MMD-AP0091SPH (-C, -K),
MMD-AP0121SPH (-C, -K),
MMD-AP0151SPH (-C, -K),
MMD-AP0181SPH (-C, -K),
MMD-AP0071SH-C
MMD-AP0091SH-C,
MMD-AP0121SH-C,
MMD-AP0151SH-C,
MMD-AP0181SH-C

- This Service Manual describes contents of the new Slim Duct indoor unit.
  For the outdoor unit, refer to the Manual with **FILE NO. A03-009**.

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SAFETY CAUTION

The important contents concerned to the safety are described on the product itself and on this Service Manual.

Please read this Service Manual after understanding the described items thoroughly in the following contents, and keep them.

⚠ WARNING	
Check earth wires.	**Before troubleshooting or repair work, check the earth wire is connected to the earth terminals of the main unit, otherwise an electric shock is caused when a leak occurs.** If the earth wire is not correctly connected, contact an electric engineer for rework.
Prohibition of modification.	**Do not modify the products.** Do not also disassemble or modify the parts. It may cause a fire, electric shock or injury.
Use specified parts.	**For spare parts, use those specified (∗).** If unspecified parts are used, a fire or electric shock may be caused. ∗: For details, refer to the parts list.
Do not bring a child close to the equipment.	**Before troubleshooting or repair work, do not bring a third party (a child, etc.) except the repair engineers close to the equipment.** It causes an injury with tools or disassembled parts. Please inform the users so that the third party (a child, etc.) does not approach the equipment.
Insulating measures	**Connect the cut-off lead cables with crimp contact, etc, put the closed end side upward and then apply a water-cut method, otherwise a leak or production of fire is caused at the users' side.**
No fire	**When repairing the refrigerating cycle, take the following measures.** 1) Be attentive to fire around the cycle. When using a gas stove, etc, be sure to put out fire before work; otherwise the oil mixed with refrigerant gas may catch fire. 2) Do not use a welder in the closed room. When using it without ventilation, carbon monoxide poisoning may be caused. 3) Do not bring inflammables close to the refrigerant cycle, otherwise fire of the welder may catch the inflammables.
Refrigerant	**Check the used refrigerant name and use tools and materials of the parts which match with it.** For the products which use R410A refrigerant, the refrigerant name is indicated at a position on the outdoor unit where is easy to see. To prevent miss-charging, the route of the service port is changed from one of the former R22. **For an air conditioner which uses R410A, never use other refrigerant than R410A. For an air conditioner which uses other refrigerant (R22, etc.), never use R410A.** If different types of refrigerant are mixed, abnormal high pressure generates in the refrigerating cycle and an injury due to breakage may be caused. **Do not charge refrigerant additionally.** If charging refrigerant additionally when refrigerant gas leaks, the refrigerant composition in the refrigerating cycle changes resulted in change of air conditioner characteristics or refrigerant over the specified standard amount is charged and an abnormal high pressure is applied to the inside of the refrigerating cycle resulted in cause of breakage or injury. Therefore if the refrigerant gas leaks, recover the refrigerant in the air conditioner, execute vacuuming, and then newly recharge the specified amount of liquid refrigerant. In this time, never charge the refrigerant over the specified amount. **When recharging the refrigerant in the refrigerating cycle, do not mix the refrigerant or air other than R410A into the specified refrigerant.** If air or others is mixed with the refrigerant, abnormal high pressure generates in the refrigerating cycle resulted in cause of injury due to breakage. **After installation work, check the refrigerant gas does not leak.** If the refrigerant gas leaks in the room, poisonous gas generates when gas touches to fire such as fan heater, stove or cocking stove though the refrigerant gas itself is innocuous. **Never recover the refrigerant into the outdoor unit.** When the equipment is moved or repaired, be sure to recover the refrigerant with recovering device. The refrigerant cannot be recovered in the outdoor unit; otherwise a serious accident such as breakage or injury is caused.

⚠ WARNING	
Assembly/Cabling	**After repair work, surely assemble the disassembled parts, and connect and lead the removed cables as before. Perform the work so that the cabinet or panel does not catch the inner cables.** If incorrect assembly or incorrect cable connection was done, a disaster such as a leak or fire is caused at user's side.
Insulator check	**After the work has finished, be sure to use an insulation tester set (500V mugger) to check the resistance is 2MW or more between the charge section and the non-charge metal section (Earth position).** If the resistance value is low, a disaster such as a leak or electric shock is caused at user's side.
Ventilation	**When the refrigerant gas leaks during work, execute ventilation.** If the refrigerant gas touches to a fire, poisonous gas generates. A case of leakage of the refrigerant and the closed room full with gas is dangerous because a shortage of oxygen occurs. Be sure to execute ventilation.
Be attentive to electric shock	**When checking the circuit inevitably under condition of the power-ON, use rubber gloves and others not to touch to the charging section.** If touching to the charging section, an electric shock may be caused.
Compulsion	**When the refrigerant gas leaks, find up the leaked position and repair it surely.** If the leaked position cannot be found up and the repair work is interrupted, pump-down and tighten the service valve, otherwise the refrigerant gas may leak into the room. The poisonous gas generates when gas touches to fire such as fan heater, stove or cocking stove though the refrigerant gas itself is innocuous. **When installing equipment which includes a large amount of charged refrigerant such as a multi air conditioner in a sub-room, it is necessary that the density does not the limit even if the refrigerant leaks.** If the refrigerant leaks and exceeds the limit density, an accident of shortage of oxygen is caused. **For the installation/moving/reinstallation work, follow to the Installation Manual.** If an incorrect installation is done, a trouble of the refrigerating cycle, water leak, electric shock or fire is caused.
Check after rerair	**After repair work has finished, check there is no trouble.** If check is not executed, a fire, electric shock or injury may be caused. For a check, turn off the power breaker.
	After repair work (installation of front panel and cabinet) has finished, execute a test run to check there is no generation of smoke or abnormal sound. If check is not executed, a fire or an electric shock is caused. Before test run, install the front panel and cabinet.
Check after reinstallation	**Check the following items after reinstallation.** 1) The earth wire is correctly connected. 2) The power cord is not caught in the product. 3) There is no inclination or unsteadiness and the installation is stable. If check is not executed, a fire, an electric shock or an injury is caused.

⚠ CAUTION	
Put on gloves	**Be sure to put on gloves (*) during repair work.** If not putting on gloves, an injury may be caused with the parts, etc. (*) Heavy gloves such as work gloves
Cooling check	**When the power was turned on, start to work after the equipment has been sufficiently cooled.** As temperature of the compressor pipes and others became high due to cooling/heating operation, a burn may be caused.

• New Refrigerant (R410A)

This air conditioner adopts a new HFC type refrigerant (R410A) which does not deplete the ozone layer.

1. Safety Caution Concerned to New Refrigerant

The pressure of R410A is high 1.6 times of that of the former refrigerant (R22). Accompanied with change of refrigerant, the refrigerating oil has been also changed. Therefore, be sure that water, dust, the former refrigerant or the former refrigerating oil is not mixed into the refrigerating cycle of the air conditioner with new refrigerant during installation work or service work. If an incorrect work or incorrect service is performed, there is a possibility to cause a serious accident. Use the tools and materials exclusive to R410A to purpose a safe work.

2. Cautions on Installation/Service

(1) Do not mix the other refrigerant or refrigerating oil.

For the tools exclusive to R410A, shapes of all the joints including the service port differ from those of the former refrigerant in order to prevent mixture of them.

(2) As the use pressure of the new refrigerant is high, use material thickness of the pipe and tools which are specified for R410A.

(3) In the installation time, use clean pipe materials and work with great attention so that water and others do not mix in because pipes are affected by impurities such as water, oxide scales, oil, etc. Use the clean pipes.

Be sure to brazing with flowing nitrogen gas. (Never use gas other than nitrogen gas.)

(4) For the earth protection, use a vacuum pump for air purge.

(5) R410A refrigerant is azeotropic mixture type refrigerant. Therefore use liquid type to charge the refrigerant. (If using gas for charging, composition of the refrigerant changes and then characteristics of the air conditioner change.)

3. Pipe Materials

For the refrigerant pipes, copper pipe and joints are mainly used. It is necessary to select the most appropriate pipes to conform to the standard. Use clean material in which impurities adhere inside of pipe or joint to a minimum.

(1) Copper pipe

<Piping>

The pipe thickness, flare finishing size, flare nut and others differ according to a refrigerant type.

When using a long copper pipe for R410A, it is recommended to select “Copper or copper-base pipe without seam” and one with bonded oil amount 40mg/10m or less. Also do not use crushed, deformed, discolored (especially inside) pipes. (Impurities cause clogging of expansion valves and capillary tubes.)

<Flare nut>

Use the flare nuts which are attached to the air conditioner unit.

(2) Joint

The flare joint and socket joint are used for joints of the copper pipe.
The joints are rarely used for installation of the air conditioner. However clear impurities when using them.

4. Tools

(1) Required Tools for R410A

Mixing of different types of oil may cause a trouble such as generation of sludge, clogging of capillary, etc. Accordingly, the tools to be used are classified into the following three types.

1) Tools exclusive for R410A (Those which cannot be used for conventional refrigerant (R22))
2) Tools exclusive for R410A, but can be also used for conventional refrigerant (R22)
3) Tools commonly used for R410A and for conventional refrigerant (R22)

The table below shows the tools exclusive for R410A and their interchangeability.

Tools exclusive for R410A (The following tools for R410A are required.)

Tools whose specifications are changed for R410A and their interchangeability

No.	Used tool	Usage	R410A air conditioner installation		Conventional air conditioner installation
			Existence of new equipment for R410A	Whether conventional equipment can be used	Whether new equipment can be used with conventional refrigerant
①	Flare tool	Pipe flaring	Yes	*(Note 1)	Yes
②	Copper pipe gauge for adjusting projection margin	Flaring by conventional flare tool	Yes	*(Note 1)	*(Note 1)
③	Torque wrench	Connection of flare nut	Yes	No	No
④	Gauge manifold	Evacuating, refrigerant charge, run check, etc.	Yes	No	No
⑤	Charge hose				
⑥	Vacuum pump adapter	Vacuum evacuating	Yes	No	Yes
⑦	Electronic balance for refrigerant charging	Refrigerant charge	Yes	Yes	Yes
⑧	Refrigerant cylinder	Refrigerant charge	Yes	No	No
⑨	Leakage detector	Gas leakage check	Yes	No	Yes
⑨	Charging cylinder	Refrigerant charge	(Note 2)	No	No

(Note 1) When flaring is carried out for R410A using the conventional flare tools, adjustment of projection margin is necessary. For this adjustment, a copper pipe gauge, etc. are necessary.

(Note 2) Charging cylinder for R410A is being currently developed.

General tools (Conventional tools can be used.)

In addition to the above exclusive tools, the following equipments which serve also for R22 are necessary as the general tools.

(1) Vacuum pump
Use vacuum pump by attaching vacuum pump adapter.
(2) Torque wrench
(3) Pipe cutter
(4) Reamer
(5) Pipe bender
(6) Level vial
(7) Screwdriver (+, –)
(8) Spanner or Monkey wrench
(9) Hole core drill
(10) Hexagon wrench (Opposite side 4mm)
(11) Tape measure
(12) Metal saw

Also prepare the following equipments for other installation method and run check.

(1) Clamp meter
(2) Thermometer
(3) IInsulation resistance tester
(4) Electroscope

5. Recharge of Refrigerant

When recharge of the refrigerant is required, charge the new refrigerant with the specified amount in the procedure as described below.

Recover the refrigerant and check there is no refrigerant in the equipment.

↓

Connect the charge hose to the packed valve service ports at gas side, liquid side, and balance side of the outdoor unit.

↓

Connect the charge hose to vacuum pump adaptor.

↓

Open the packed valves of the balance pipe fully at liquid and gas sides, and then return the valve at gas side a little to the closed side.

↓

Open fully PMV of the outdoor unit.
- Turn on power of the outdoor unit.
- Short CN30 on I/F P.C. board of the outdoor unit.
- Turn off power of the outdoor unit within 2 minutes after short-circuiting.

↓

Open fully the handle Low of the gauge manifold, and then turn on the power of vacuum pump for vacuuming.

↓

When the pressure has lowered until indication of the compound gauge pointed -0.1MPa (-76cmHg), open fully the handle Low and turn off the power of vacuum pump.

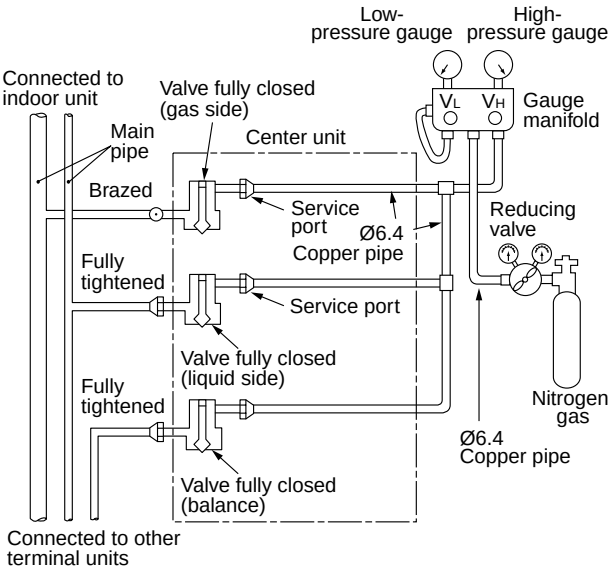
↓

Leave it as it is for 1 to 2 minutes and check the indicator of the compound gauge does not return.

↓

Set the refrigerant cylinder on the electron balance, connect the charge hose to connecting ports of the cylinder and the electron gauge, and then charge the liquid refrigerant from the service port at liquid side. (Shield with the gauge manifold so that refrigerant does not flow to gas side.)

(Charge the refrigerant as below.)

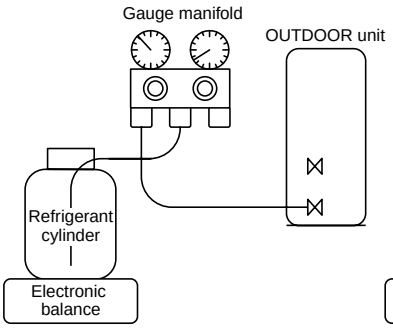


① Never charge the refrigerant over the specified amount.
② Do not charge the additional refrigerant.
If charging refrigerant additionally when refrigerant gas leaks, the refrigerant composition in the refrigerating cycle changes resulted in change of air conditioner characteristics or refrigerant over the specified standard amount is charged and an abnormal high pressure is applied to the inside of the refrigerating cycle resulted in cause of breakage or injury.

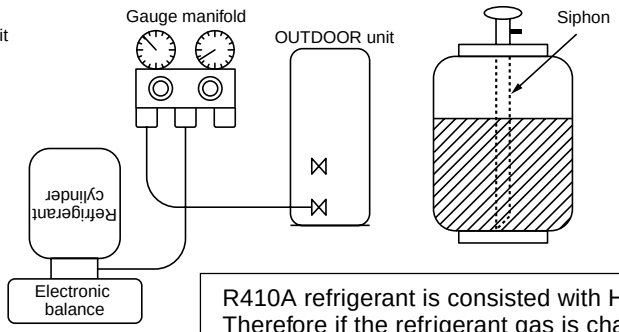
4mm-hexagonal wrench is required.

① Set the equipment so that liquid refrigerant can be charged.
② When using a cylinder with siphon pipe, liquid can be charged without inversing the cylinder.

[Cylinder with siphon]



[Cylinder without siphon]



R410A refrigerant is consisted with HFC mixed refrigerant. Therefore if the refrigerant gas is charged, the composition of the charged refrigerant changes and characteristics of the equipment changes.

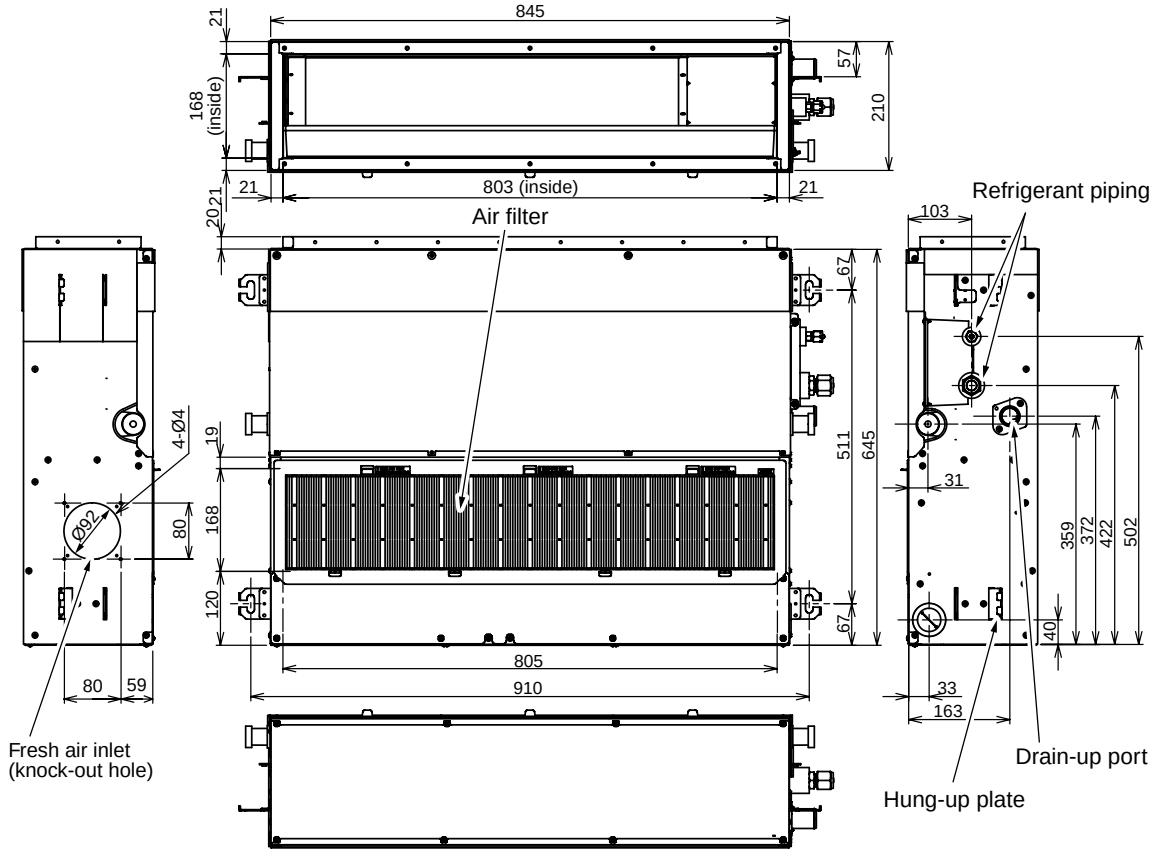
6. Environment

Use “Vacuum pump method” for an air purge (Discharge of air in the connecting pipe) in installation time.

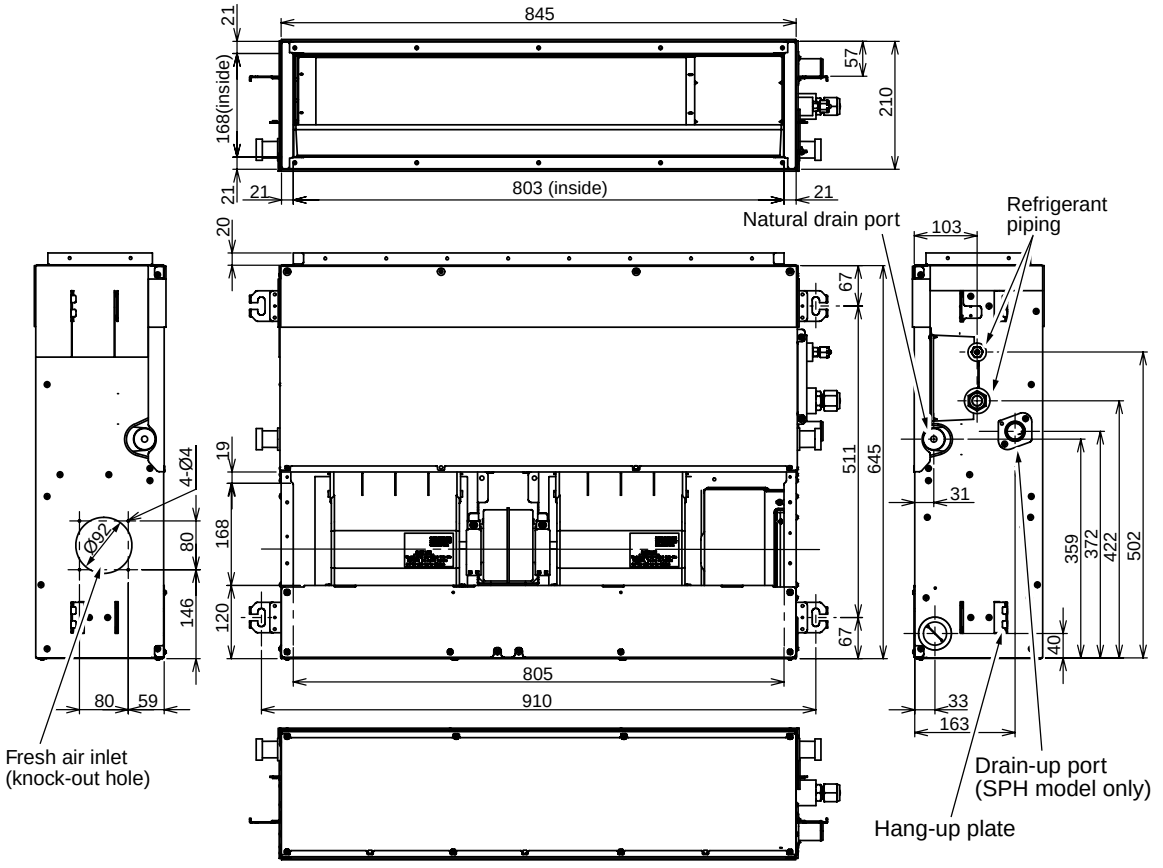
- Do not discharge flon gas into the air to protect the earth environment.
- Using the vacuum pump method, clear the remained air (Nitrogen, etc.) in the unit. If the air remains, the pressure in the refrigerating cycle becomes abnormally high and an injury and others are caused due to burst.

1. CONSTRUCTION VIEWS (EXTERNAL VIEWS)

MMD-AP0071SPH(-K), AP0091SPH(-K), AP0121SPH(-K), AP0151SPH(-K), AP0181SPH(-K)

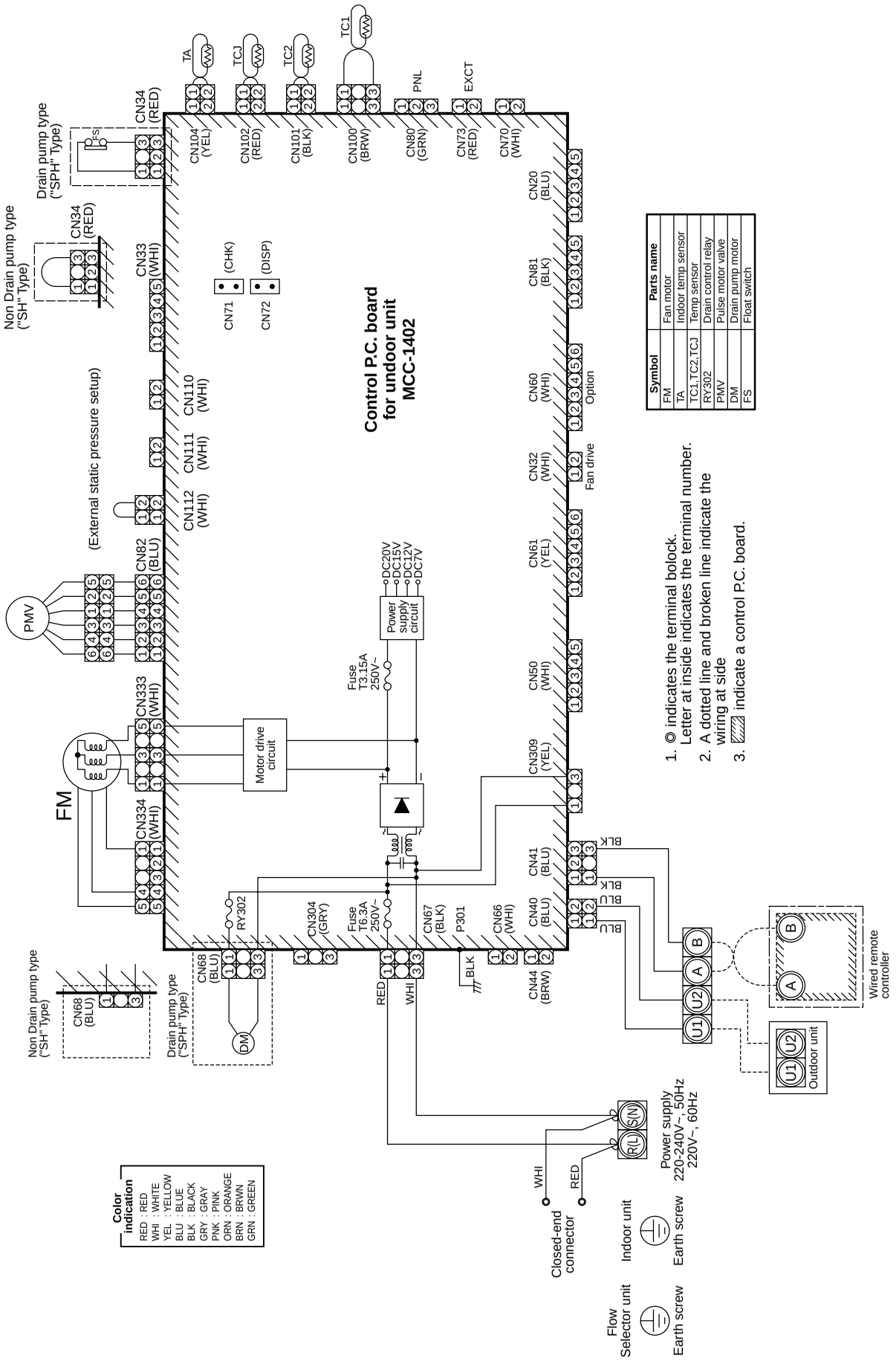


MMD-AP0071SPH-C, AP0091SPH-C, AP0121SPH-C, AP0151SPH-C, AP0181SPH-C, MMD-AP0071SH-C, AP0091SH-C, AP0121SH-C, AP0151SH-C, AP0181SH-C



2. WIRING DIAGRAM

MMD-AP0071SPH(SH), AP0091SPH(SH), AP0121SPH(SH), AP0151SPH(SH), AP0181SPH(SH)



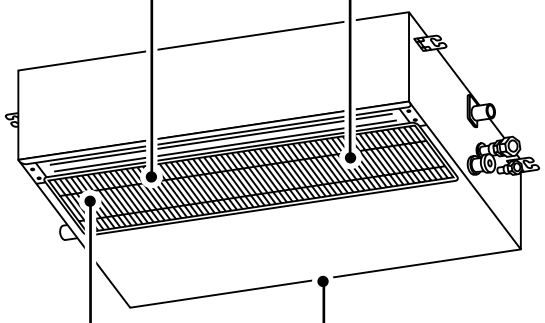
3. PARTS RATING

3-1. Parts Rating

Model MMD-	AP0071SPH	AP0091SPH	AP0121SPH	AP0151SPH	AP0181SPH
Fan motor	SWF-280-60-1				
Pulse motor	EDM-MD12TF-3				
Pulse motor valve	EDM-B25YGTF			EDM-B40YGTF	
Drain pump motor ∗	ADP-1409				
Float switch ∗	FS-0218-102				
TA sensor	Lead wire length : 1558mm Vinyl tube				
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)				
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)				
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)				

∗ “SPH” series only

3-2. Name of Each Part



Air inlet
Suction duct is connected.

Earth screw
It is included in the electric parts box.

Air filter
(Air filter is not provided to some models in the series.)

Air outlet
Discharge duct is connected.

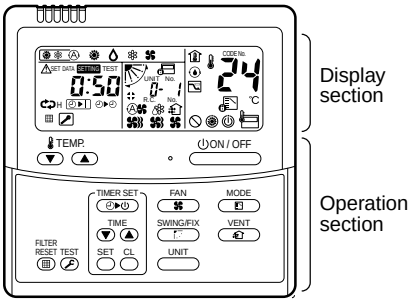
3-3. Parts Name of Remote Controller

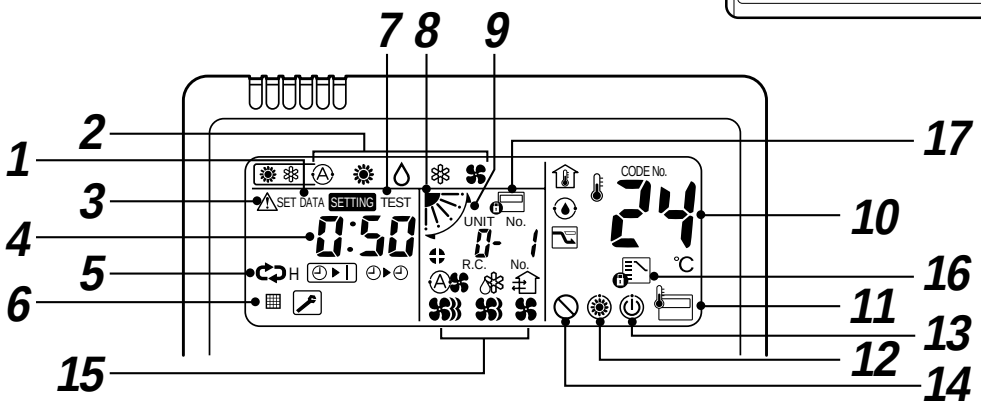
Display section

In the display example, all indicators are displayed for the explanation.

In reality only, the selected contents are indicated.

- When turning on the leak breaker at the first time, [**SET DATA]** flashes on the display part of the remote controller. While this display is flashing, the model is being automatically confirmed. Accordingly, wait for a while after [**SET DATA]** display has disappeared, and then use the remote controller.





1 SET DATA display

Displayed during setup of the timer.

2 Operation mode select display

The selected operation mode is displayed.

3 CHECK display

Displayed while the protective device works or a trouble occurs.

4 Timer time display

Time of the timer is displayed.
(When a trouble occurs, the check code is displayed.)

5 Timer SETIN setup display

When pushing the Timer SETIN button, the display of the timer is selected in order of [OFF] → [OFF] repeat OFF timer → [ON] → No display.

6 Filter display

If "FILTER" is displayed, clean the air filter.

7 TEST run display

Displayed during a test run.

8 Flap position display (for 4-Way Air Discharge Cassette Type and Under Ceiling Type model only)

Displays flap position.

9 SWING display

Displayed during up/down movement of the flap.

10 Set up temperature display

The selected set up temp. is displayed.

11 Remote controller sensor display

Displayed while the sensor of the remote controller is used.

12 PRE-HEAT display

Displayed when the heating operation starts or defrost operation is carried out.

While this indication is displayed, the indoor fan stops or the mode enters in LOW.

13 Operation ready display

Displayed when cooling or heating operation is impossible because the outdoor temperature goes out of the operable range.

14 No function display

Displayed if there is no function even if the button is pushed.

15 Air volume select display

The selected air volume mode is displayed.
(AUTO) (HIGH)
(MED.) (LOW)

In the Concealed Duct High Static Pressure type models, [HIGH] only is displayed for the air speed.

16 Mode select control display

Displayed when pushing "Operation mode select" button while the operation mode is fixed to heating or cooling by the system manager of the air conditioner.

17 Central control display

Displayed when using the remote controller together with the central control remote controller, etc.

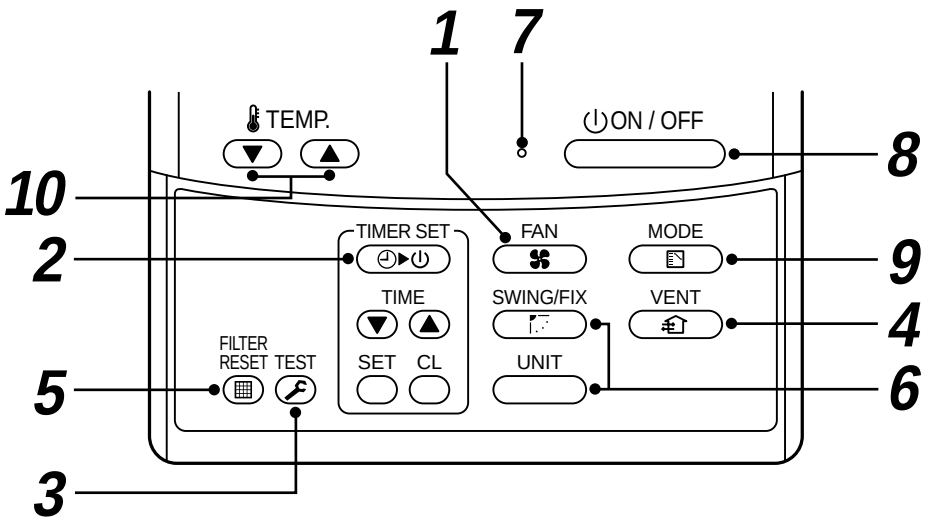
If Remote controller is prohibited at the centralcontrol side, flashes when operating ON / OFF, MODE, / buttons and the change is not accepted.

(The contents available to be set up on the remote controller differ according to the central control mode. For details, refer to Owner's Manual of the central control remote controller.)

Operation section

Push each button to select a desired operation.

- The details of the operation needs to be set up once, afterward, the air conditioner can be used by pushing ON / OFF button only.



1 Air volume select button

Selects the desired air volume mode.

The Concealed Duct High Static Pressure type models cannot be operated.

2 Timer set button

TIMER SET button is used when the timer is set up.

3 Check button

The CHECK button is used for the check operation. During normal operation, do not use this button.

4 Fan button

FAN button is used when a fan which is sold on the market or etc. is connected.

- If ⊘ is displayed on the remote controller when pushing the FAN button, a fan is not connected.

5 Filter reset button

Resets (Erases) "FILTER ▦ " display.

6 Wind direction and Swing

UNIT :

If the multiple indoor units are operated by only one remote controller, select the units when the air direction is adjusted.

SWING/FIX :

Set up the auto swing and angle of the flap.

- This function is not provided to Concealed Duct Standard Type, High Static Pressure Type, Floor standing Cabinet Type, Floor Standing Concealed Type, or Slim Duct Type.

7 Operation lamp

Lamp is lit during the operation. Lamp is off when stopped.

Although it flashes when operating the protection device or abnormal time.

8 ON / OFF button

When the button is pushed, the operation starts, and it stops by pushing the button again.

When the operation has stopped, the operation lamp and all the displays disappear.

9 Operation select button

Selects desired operation mode.

10 Set up temperature button

Adjusts the room temperature.

Set the desired set temperature by pushing ▼ or ▲ .

OPTION :

Remote controller sensor

UUsually the TEMP. sensor of the indoor unit senses the temperature. The temperature on the surrounding of the remote controller can also be sensed.
For details, contact the dealer from which you have purchased the air conditioner.

- In case that one remote controller controls the multiple indoor units, the setup operation is unavailable in group control.

3-4. Correct Usage

When you use the air conditioner for the first time or when you change the SET DATA value, follow the procedure below. From the next time, the operation displayed on the remote controller will start by pushing the ON / OFF button only.

Preparation

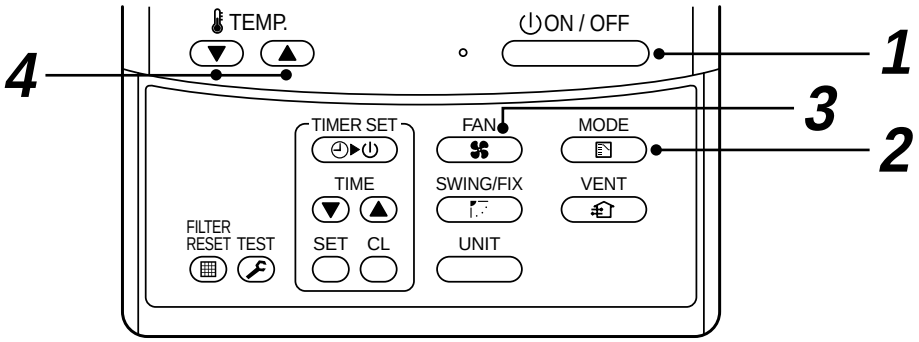
Turn on the main power switch and/or the leakage breaker.

- When the power supply is turned on, a partition line is displayed on the display part of the remote controller.

* After the power supply is turned on, the remote controller does not accept an operation for approx. 1 minute, but it is not a failure.

REQUIREMENT

- While using the air conditioner, operate it only with ON / OFF button without turning off the main power switch and the leak breaker.



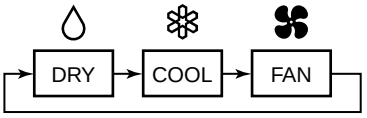
1 Push ON / OFF button.

The operation lamp goes on, and the operation starts.

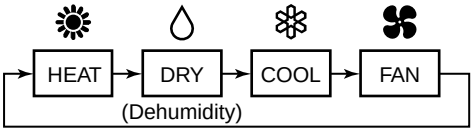
2 Select an operation mode with the "MODE" button.

One push of the button, and the display changes in the order shown on the right.

Cooling only model



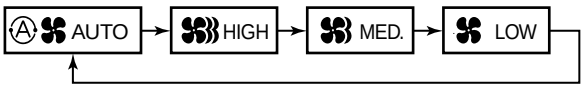
Heat-pump model



- In HEAT mode, if the room temperature reaches to the set temperature, the outdoor unit stops and the air flow becomes LOW and the air volume decreases.
- In the defrost mode, the fan stops so that cool air is not discharged and PRE-DEF is displayed.

3 Select air volume with "" button.

One push of the button, and the display changes in the order shown on the right.



- When air volume is "AUTO", air volume differs according to the temperature difference between set temp. and room temp.
- In DRY mode, "AUTO" is displayed and the air volume is LOW.
- In heating operation, if the room temperature is not heated sufficiently with VOLUME "LOW" operation, select "MED." or "HIGH" operation.

4 Determine the set up temperature by pushing the "TEMP. TEMP. ▼" or "TEMP. ▲" button.

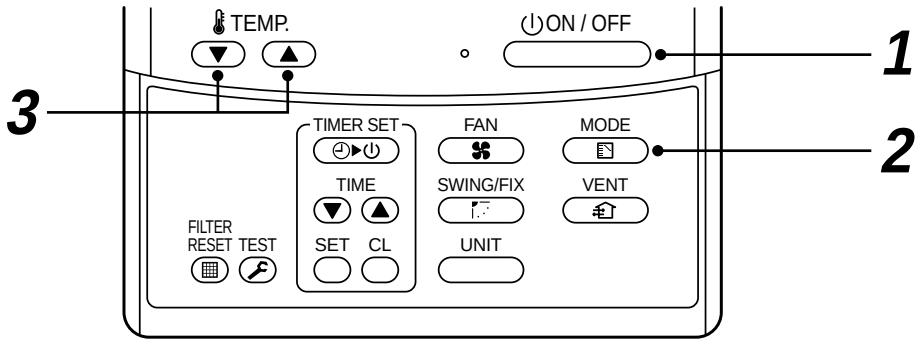
Stop

Push ON / OFF button.

The operation lamp goes off, and the operation stops.

3-5. Automatic Operation (Super Heat Recovery Type Only)

When you set the air conditioner in Ⓐ mode or switch over from AUTO operation because of some settings change, it will automatically select either cooling, heating, or fan only operation depending on the indoor temperature.



Start

1 ON / OFF button

Push this button to start the air conditioner.

2 Mode select button (MODE)

Select Auto.

3 Temperature button

Set the desired temperature.

- In case of cooling, start the operation after approx. 1 minute.
- In case of heating, the operation mode is selected in accordance with the room temperature and operation starts after approximately 3 to 5 minutes.
- When you select the Auto mode, it is unnecessary to set the fan speed.
  The FAN speed display will show AUTO and the fan speed will be automatically controlled.
- After the heating operation has stopped, FAN operation may continue for approx. 30 seconds.
- When the room temperature reaches the set temperature and the outdoor unit stops, the super low wind is discharged and the air volume decreases excessively.
  During defrost operation, the fan stops so that cool air is not discharged and “HEAT READY” is displayed.
- If the Auto mode is uncomfortable, you can select the desired conditions manually.

NOTE

When restarting the operation after stop

- When restarting the operation immediately after stop, the air conditioner does not operate for approx. 3 minutes to protect the machine.

Stop

Push ON / OFF button.

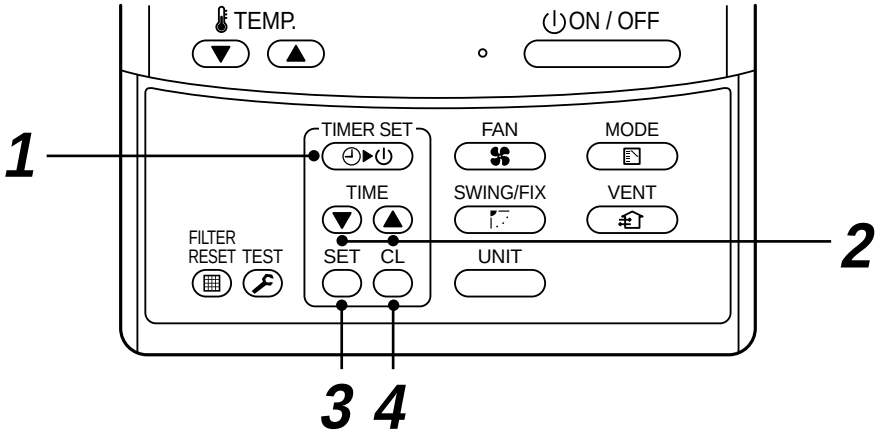
Push this button again to stop the air conditioner.

3-6. TIMER Operation

A type of timer operation can be selected from the following three types.

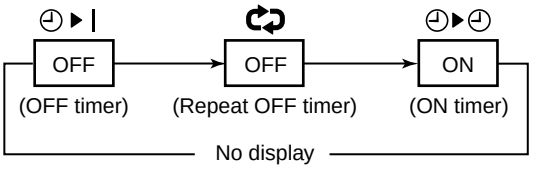
OFF timer : The operation stops when the time of timer has reached the set time.
Repeat OFF timer : Every time, the operation stops after the set time has passed.
ON timer : The operation starts when the time of timer has reached the set time.

Timer operation



1 Push TIMER SET button.

- The timer display (type) changes for every push of the button.
- SET TIME and timer time displays flash.



2 Push TIME ▼ ▲ to select "SET TIME".

For every push of ▲ button, the set time increases in the unit of 0.5 hr (30 minutes).
The maximum set time is 72.0 hr.
For every push of ▼ button, the set time decreases in the unit of 0.5 hr (30 minutes).
The minimum set time is 0.5 hr.

3 Push SET button.

- SETTING display disappears and timer time display goes on.
  (When ON timer is activated, timer time, ON timer ◴▸◴ are displayed and other displays disappear.)

Cancel of timer operation

4 Push CL button.

- TIMER display disappears.

NOTICE

- When the operation stops after the timer reached the preset time, the Repeat OFF timer resumes the operation by pushing ON / OFF button and stops the operation after the time of the timer has reached the set time.

3-7. Information

Confirmation before operation

- Turn on the power switch 12 hours before starting the operation.
- Make sure whether earth wire is connected.
- Make sure the air filter is connected to the indoor unit.

Heating capacity

- A heat pump system which absorbs heat from outside of the room and then discharges heat into the room is adopted for heating. If the outside temperature falls, the heating capacity decreases.
- When the outside temperature is too low, it is recommended to use this air conditioner together with other heating equipment.

Defrost during heating operation

- In heating operation, if there is frost on the outdoor unit, the operation changes automatically to the defrost operation (Approx. 2 to 10 minutes) to increase the heating efficiency.
- During defrost operation, the fan of the indoor unit stops.

3-minutes protection

- When restarting the operation just after the operation has been stopped or the main power switch has turned on, the outdoor unit does not work for approx. 3 minutes in order to protect the air conditioner.

Power failure

- If a power failure occurred during operation, all operations stop.
- When the power is returned after a power failure, the operation lamp notifies the power-ON by flashing operation lamp on the remote controller.
- When restarting the operation, push ⏻ON / OFF button again.

Fan rotation in stopped unit

- In heating operation even in the stopped indoor unit, the fan rotates once for several minutes per approx. an hour when the other indoor unit is operating to protect the air conditioner.

Protective device (High pressure switch)

This device stops automatically an operation when excessive force is applied on the air conditioner.

If the protective device works, the operation stops and the operation lamp flashes.

When the protective device works, the indication TEST and the check code are displayed on the display section of the remote controller. In the following cases, the protective device may work.

In cooling operation

- The suction port or discharge port of the outdoor unit is closed.
- A strong wind continuously blows to the discharge port of the outdoor unit.

In heating operation

- Dust or waste adheres excessively to air filter of the indoor unit.
- The discharge port of the indoor unit is closed.

If the protective device works, turn off the main power switch, solve the cause, and then start the operation again.

Cooling/Heating operation of Super Modular Multi system air conditioner

- Although each indoor unit can be individually controlled in the Super Modular Multi system air conditioner, the cooling operation and the heating operation cannot be simultaneously performed in the multiple indoor units which are connected to an outdoor unit.
- If the cooling operation and the heating operation are simultaneously performed, the indoor unit which executes cooling operation stops, and ❄ on the operation section lights up. On the other hand, the indoor unit which executes heating operation continues running. In a case that the manager of the air conditioner has fixed the operation to cooling or heating, an operation other than that set up is unavailable. If an operation other than that set up is executed, ❄ on the operation section lights up and the operation stops.

Characteristics of heating operation

- The wind is not out just after starting an operation. The hot wind starts to blow 3 to 5 minutes after (Time differs according to indoor/outdoor temperature.) the indoor heat exchanger has warmed up.
- During operation, the outdoor unit may stop if the outside temperature rises.

3-8. Air Conditioner Operations and Performance

3 minutes protection function

3-minutes protection function prevents the air conditioner from starting for initial 3 minutes after the main power switch/circuit breaker is turned on for re-starting the air conditioner.

Power failure

Power failure during operation will stop the unit completely.

- To restart the operation, push the START/STOP button on the remote controller.
- Lightning or a wireless car telephone operating nearby may cause the unit to malfunction. Turn off the main power switch or circuit breaker and then turn them on again. Push the START/STOP button on the remote controller to restart.

Heating characteristics
Preheating operation

The air conditioner will not deliver warm air immediately after it is turned on. Warm air will start to flow out after approximately 5 minutes when the indoor heat exchanger warmed up.

Warm air control (In heating operation)

When the room temperature reaches the set temperature, the fan speed is automatically reduced to prevent to blow cold draft. At this time, the outdoor unit will stop.

Defrosting operation

If the outdoor unit is frosted during the heating operation, defrosting starts automatically (for approximately 2 to 10 minutes) to maintain the heating capacity.

- The fans in both indoor and outdoor units will stop during the defrosting operation.
- During the defrosting operation, the defrosted water will be drained from the bottom plate of the outdoor unit.

Heating capacity

In the heating operation, the heat is absorbed from the outside and brought into the room. This way of heating is called heat pump system. When the outside temperature is too low, it is recommended to use another heating apparatus in combination with the air conditioner.

Attention to snowfall and freeze on the outdoor unit

- In snowy areas, the air inlet and air outlet of the outdoor unit are often covered with snow or frozen up. If snow or freeze on the outdoor unit is left as it is, it may cause machine failure or poor warming.
- In cold areas, pay attention to the drain hose so that it perfectly drains water without water remaining inside for freeze prevention. If water freezes in the drain hose or inside the outdoor unit, it may cause machine failure or poor warming.

Air conditioner operating conditions

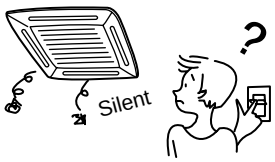
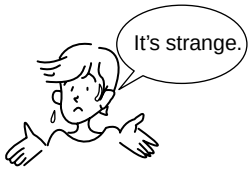
For proper performance, operate the air conditioner under the following temperature conditions:

Cooling operation	Outdoor temperature : –5°C to 43°C (Dry valve temp.)
	Room temperature : 21°C to 32°C (Dry valve temp.), 15°C to 24°C (Wet valve temp.)
	CAUTION Room relative humidity – less than 80 %. If the air conditioner operates in excess of this figure, the surface of the air conditioner may cause dewing.
Dry operation	Outdoor temperature : 15°C to 21°C (Dry valve temp.), –15°C to 15.5°C (Wet valve temp.)
	Room temperature : 15°C to 28°C (Dry valve temp.)

If air conditioner is used outside of the above conditions, safety protection may work.

3-9. When the Following Symptoms are Found

Check the points described below before asking repair servicing.

	Symptom	Cause
Check again.	Outdoor unit • White misty cold air or water is out. • Sometimes, noise “Pushu !” is heard.	• Fan of the outdoor unit stops automatically and performs defrost operation. • Solenoid valve works when defrost operation starts or finishes.
	Indoor unit • “Swish” sound is heard sometimes.	• When the operation has started, during the operation, or immediately after the operation has stopped, a sound such as water flows may be heard, and the operation sound may become larger for 2 or 3 minutes immediately after the operation has started. They are flowing sound of refrigerant or draining sound of dehumidifier.
	• Slight “Pishi!” sound is heard.	• This is sound generated when heat exchanger, etc. expand and contract slightly due to change of temperature.
	• Discharge air smells.	• Various smell such as one of wall, carpet, clothes, cigarette, or cosmetics adhere to the air conditioner.
	• The operation lamp flashes	• Flashes when power is turned on again after power failure, or when power switch is turned on.
	• “STANDBY” indication is lit.	• When cooling operation cannot be performed because another indoor unit performs heating operation.
		• When the manager of the air conditioner has fixed the operation to COOL or HEAT, and an operation contrary to the setup operation is performed.
		• When fan operation stopped to prevent discharge of hot air.
	• Sound or cool air is output from the stand by indoor unit.	• Since refrigerant is flowed temporarily to prevent stay of oil or refrigerant in the stand by indoor unit, sound of flowing refrigerant, “Kyururu” or “Shaa” may be heard or white steam when other indoor unit operates in HEAT mode, and cold air in COOL mode may be blow-out.
	• When power of the air conditioner is turned on, “Ticktock” sound is heard.	• Sound is generated when the expansion valve operates when power has been turned on.
It is not a failure.	Operates or stops automatically.	• Is the timer “ON” or “OFF”?
	Does not operate. 	• Is it a power failure? • Is the power switch turned off? • Is the power fuse or breaker blown? • Has the protective device operated? (The operation lamp goes on.) • Is the timer “ON”? (The operation lamp goes on.) • Are COOL and HEAT selected simultaneously? (“STANDBY” indication is lit on the display column of the remote controller.)
	Air is not cooled or warmed sufficiently. 	• Is the suction port or discharge port of the outdoor unit obstructed? • Are any door or window open? • Is the air filter clogged with dust? • Is discharge louver of the indoor unit set at appropriate position? • Is air selection set to “LOW” “MED”, and is the operation mode set to “FAN”? • Is the setup temp. the appropriate temperature? • Are COOL and HEAT selected simultaneously? (“STANDBY” indication is lit on the display column of the remote controller.)

When the following symptoms are found, stop the operation immediately, turn off the power switch, and contact the dealer which you have purchased the air conditioner.

- Activation of switch is unstable.
- Fuse or breaker is blown periodically.
- Foreign matters or water entered by mistake.
- When if activation cause of the protective device has been removed, the operation is not performed.
- Other unusual status occurred.

Accessory parts

❒ Accessory parts

Part name	Q'ty	Shape	Usage
Installation Manual	1	This manual	(Be sure to hand over to customers)
Insulating pipe	2		For insulating pipe connecting section
Washer	8	M10 × Ø34	For hanging down the unit
Hose band	1		For connecting drain pipe
Flexible hose	1		For adjustment of drain pipe centering
Heat insulator	1		For insulating drain connecting section

1 PRECAUTIONS FOR SAFETY

- Ensure that all Local, National and International regulations are satisfied.
- Read this "PRECAUTIONS FOR SAFETY" carefully before Installation.
- The precautions described below include the important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem.
  Follow the Owner's Manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before the unit maintenance.
- Ask the customer to keep the Installation Manual together with the Owner's Manual.

CAUTION **New Refrigerant Air Conditioner Installation**

- **THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER.**

The characteristics of R410A refrigerant are ; easy to absorb water, oxidizing membrane or oil, and its pressure is approx. 1.6 times higher than that of refrigerant R22. Accompanied with the new refrigerant, refrigerating oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle.

To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are charged from those for the conventional refrigerant.

Accordingly the exclusive tools are required for the new refrigerant (R410A).

For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter. Moreover, do not use the existing piping because there are problems with pressure-resistance force and impurity in it.

CAUTION **To Disconnect the Appliance from Main Power Supply.**

This appliance must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm.

⚠ WARNING

- **Ask an authorized dealer or qualified installation professional to install/maintain the air conditioner.**
  Inappropriate installation may result in water leakage, electric shock or fire.
- **Turn off the main power supply switch or breaker before attempting any electrical work.**
  Make sure all power switches are off. Failure to do so may cause electric shock.
- **Connect the connecting wire correctly.**
  If the connecting wire is connected in a wrong way, electric parts may be damaged.
- **When moving the air conditioner for the installation into another place, be very careful not to enter any gaseous matter other than the specified refrigerant into the refrigeration cycle.**
  If air or any other gas is mixed in the refrigerant, the gas pressure in the refrigeration cycle becomes abnormally high and it as a result causes pipe burst and injuries on persons.
- **Do not modify this unit by removing any of the safety guards or by by-passing any of the safety interlock switches.**
- **Exposure of unit to water or other moisture before installation may cause a short-circuit of electrical parts.**
  Do not store it in a wet basement or expose to rain or water.
- **After unpacking the unit, examine it carefully if there are possible damage.**
- **Do not install in a place that might increase the vibration of the unit.**
- **To avoid personal injury (with sharp edges), be careful when handling parts.**
- **Perform installation work properly according to the Installation Manual.**
  Inappropriate installation may result in water leakage, electric shock or fire.
- **When the air conditioner is installed in a small room, provide appropriate measures to ensure that the concentration of refrigerant leakage occur in the room does not exceed the critical level.**
- **Install the air conditioner securely in a location where the base can sustain the weight adequately.**
- **Perform the specified installation work to guard against an earthquake.**
  If the air conditioner is not installed appropriately, accidents may occur due to the falling unit.
- **If refrigerant gas has leaked during the installation work, ventilate the room immediately.**
  If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.
- **After the installation work, confirm that refrigerant gas does not leak.**
  If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas might generate.
- **Electrical work must be performed by a qualified electrician in accordance with the Installation Manual. Make sure the air conditioner uses an exclusive power supply.**
  An insufficient power supply capacity or inappropriate installation may cause fire.
- **Use the specified wires for wiring connect the terminals securely fix. To prevent external forces applied to the terminals from affecting the terminals.**
- **Conform to the regulations of the local electric company when wiring the power supply.**
  Inappropriate grounding may cause electric shock.
- **Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.**
  If a combustible gas leaks, and stays around the unit, a fire may occur.

2 INSTALLATION OF NEW REFRIGERANT AIR CONDITIONER

This air conditioner adopts the new HFC refrigerant (R410A) which does not deplete the ozone layer.

- R410A refrigerant is apt to be affected by impurity such as water, oxidizing membrane, or oils because the pressure of R410A refrigerant is higher than that of the former refrigerant by approx. 1.6 times. Accompanied with adoption of the new refrigerant, refrigerating oil has been also changed. Therefore pay attention so that water, dust, former refrigerant, or refrigerating oil does not enter into the refrigerating cycle of the new refrigerant air conditioner during installation work.
- To prevent from mixing of refrigerant or refrigerating oil, the size of charge port of the main unit or connecting section of installation tool differs from that of the air conditioner for the former refrigerant. Accordingly the exclusive tools are required for the new refrigerant (R410A) as shown below.
- For connecting pipes, use the new and clean piping materials so that water or dust does not enter.

Required tools and cautions on handling

It is necessary to prepare the tools and parts as described below for the installation work.

The tools and parts which will be newly prepared in the following items should be restricted to the exclusive use.

Explanation of symbols

● : Newly prepared (It is necessary to use it properly exclusive to R410A separated from those for R22 or R407C.)
○ : Former tool is available.

Used tools	Usage	Proper use of tools/parts
Gauge manifold	Vacuuming or charging of refrigerant and operation check	● Newly prepared, Exclusive to R410A
Charging hose		● Newly prepared, Exclusive to R410A
Charging cylinder	Charges refrigerant	Unusable (Use the Refrigerant charging balance.)
Gas leak detector	Checks gas leak	● Newly prepared
Vacuum pump	Vacuum drying	Usable if a counter-flow preventive adapter is attached
Vacuum pump with counter-flow preventive adapter	Vacuum drying	○ : R22 (Existing article)
Flare tool	Flare processing of pipes	○ : Usable by adjusting size
Bender	Bending processing of pipes	○ : R22 (Existing article)
Refrigerant recovery device	Recovers refrigerant	● Exclusive to R410A
Torque wrench	Tightens flare nut	● Ø12.7mm, Exclusive for Ø15.9mm
Pipe cutter	Cuts pipes	○ : R22 (Existing article)
Refrigerant cylinder	Charges refrigerant	● Exclusive to R410A ID : Refrigerant name entered
Welding machine/ Nitrogen gas cylinder	Welding of pipes	○ : R22 (Existing article)
Refrigerant charging balance	Charges refrigerant	○ : R22 (Existing article)

3 SELECTION OF INSTALLATION PLACE

⚠ WARNING

- **Install the air conditioner where there is sufficient strength to weight of the unit.**
  If strength is insufficient, the unit may fall down resulting in human injury.
- **Perform a specified installation work to guard against an earth quake.**
  An incomplete installation can cause accidents by the units failing and dropping.
- **Install the air conditioner at a height 2.5m or more from the floor.**
  If you insert your hands or others directly into the unit while the air conditioner operates, it is dangerous because you may contact with revolving fan or active electricity.

⚠ CAUTION

- **Do not install the air conditioner in a location subject to a risk of exposure to combustible gas.**
  Should the combustible gas leak and collect near the unit, fire may occur.

Upon approval of the customer, install the air conditioner in a place that satisfies the following conditions.

- Place where the unit can be installed horizontally.
- Place where a sufficient servicing space can be ensured for safe maintenance and check.
- Place where drained water will not cause any problem.

Avoid installing in the following places.

- Place exposed to air with high salt content (seaside area), or place exposed to large quantities of sulfide gas (hot spring). (Should the unit be used in these places, special protective measures are needed.)
- Place exposed to oil, vapor, oil smoke or corrosive gas.
- Place where organic solvent is used nearby.
- Place close to a machine generating high frequency.
- Place near door or window where may come to contact with the fresh air of high humidity. (Dewing may be caused.)
- Place where special spray is frequently used.
- Place with poor ventilation.

Installation under high-humidity atmosphere

In some cases including the rainy season, especially inside of the ceiling may become high-humidity atmosphere (dew-point temperature: 23°C or higher).

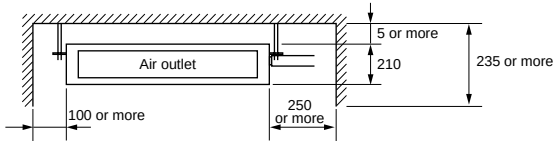
1. Installation to inside of the ceiling with tiles on the roof
2. Installation to inside of the ceiling with slated roof
3. Installation to a place where inside of the ceiling is used for pathway to intake the fresh air
   - In the above cases, additionally attach the heat insulator to all positions of the air conditioner, which come to contact with the high-humidity atmosphere. In this case, arrange the side plate (Check port) so that it is easily removed.
   - Apply also a sufficient heat insulation to the duct and connecting part of the duct.

[Reference] Dewing test conditions
Indoor side: 27°C dry bulb temperature
24°C wet bulb temperature
Air volume: Low air volume, operation time 4 hours

3 SELECTION OF INSTALLATION PLACE

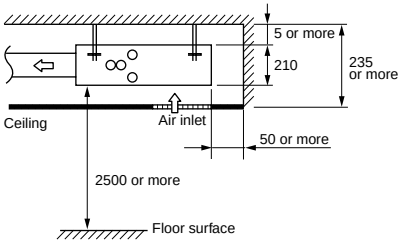
Installation space

Reserve space required for maintenance the indoor unit and service work.

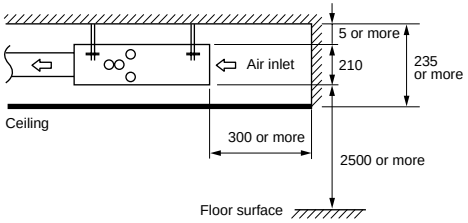


(Unit : mm)

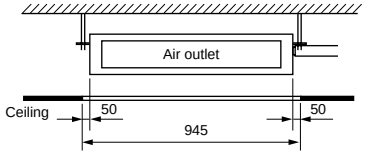
<Under air inlet>

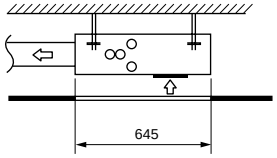


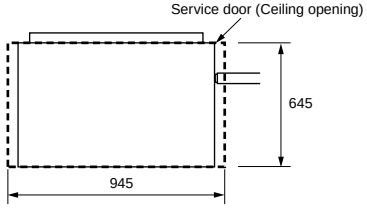
<Back air inlet>

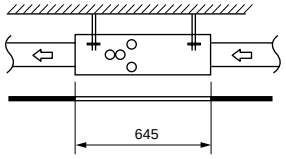


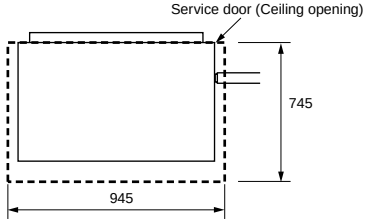
Service space

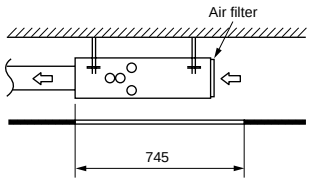






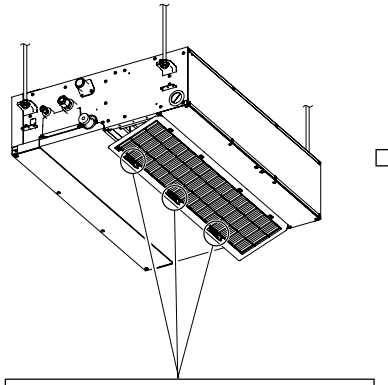


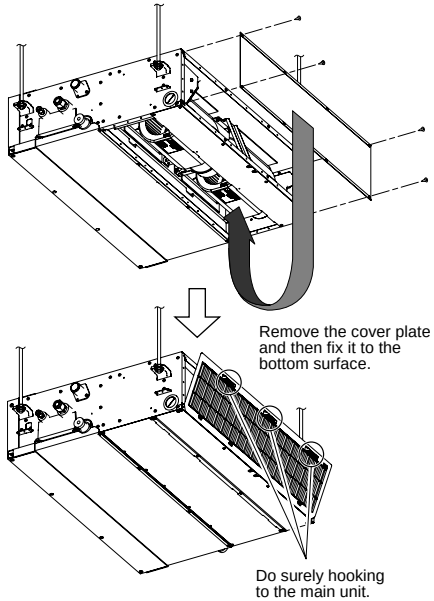




Arranging the to back air inlet type

<Back air inlet>





Notification of filter cleaning term setup

The lighting term setup of the filter sign (Notification of filter cleaning) of the remote controller can be changed according to the condition of installation.

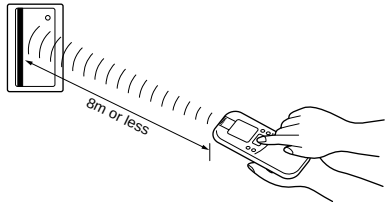
For setup method, refer to “Change of lighting term of filter sign” and “To secure better effect of heating” in the Applicable controls of this Manual.

In case of wireless type

The sensor of indoor unit with wireless remote controller can receive a signal 8m or less.

Based upon it, determine a place where the remote controller is operated and the installation place of the indoor unit.

- To prevent a malfunction, select a place where is not influenced by a florescent light or direct sunlight.
- Two or more (Up to 6 units) indoor units with wireless remote controller can be installed in the same room.



4 INSTALLATION OF INDOOR UNIT

WARNING

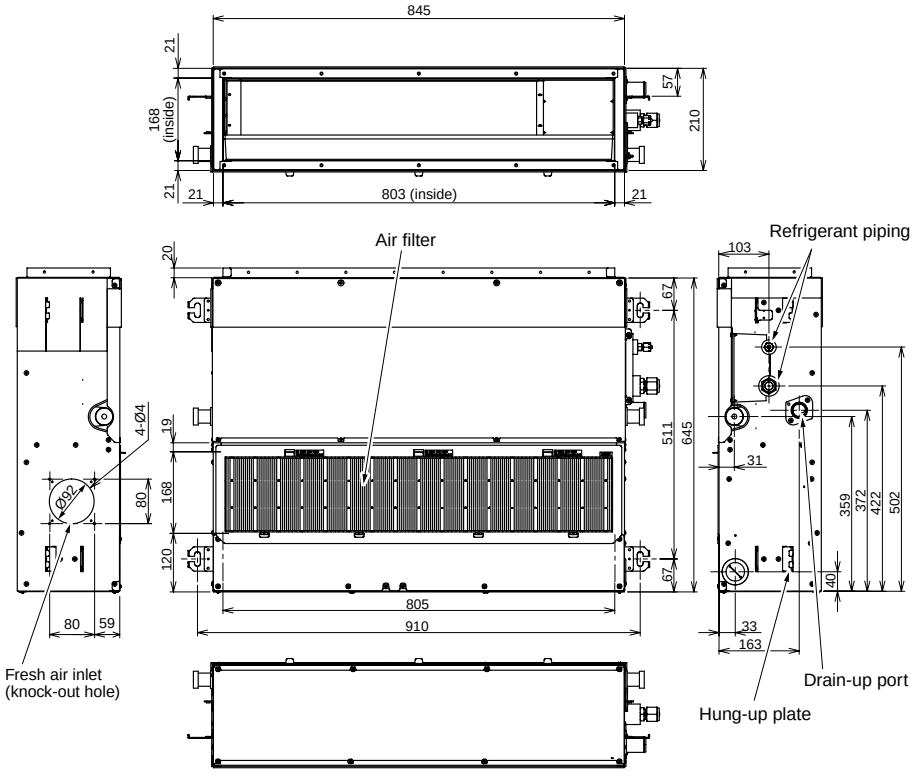
Install the air conditioner certainly to sufficiently withstand the weight.
If the strength is insufficient, the unit may fall down resulting in human injury.
Perform a specified installation work to guard against strong wind or earthquake.
An incomplete installation can cause accidents by the units falling and dropping.

REQUIREMENT

Strictly comply with the following rules to prevent damage of the indoor units and human injury.

- Do not put a heavy article on the indoor unit. (Even units are packaged)
- Carry in the indoor unit as it is packaged if possible. If carrying in the indoor unit unpacked by necessity, be sure to use buffering cloth, etc. to not damage the unit.
- To move the indoor unit, hold the hooking metals (4 positions) only.
  Do not apply force to the other parts (refrigerant pipe, drain pan, foamed parts, or resin parts, etc.).
- Carry the package by two or more persons, and do not bundle it with PP band at positions other than specified.

External view



Opening hole on ceiling and placing of hanging bolt

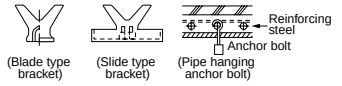
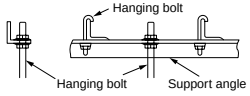
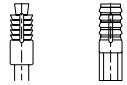
- Considering the indoor unit and the hanged-up piping/wiring work, determine the installation position and direction.
- After installation position of the indoor unit has been determined, open a hole on the wiring and place the hanging bolt.
- For opening size of the ceiling and the hanging bolt pitch, see the external view.
- When the ceiling has already boarded, draw the drain pipe, refrigerant pipe, inter-unit wire between indoor and outdoor units, central control system wire, and remote controller wire up to the position where pipes and wires are connected before hanged-up the indoor unit.

The hanging bolts and nuts will be procured locally.

Hanging bolt	M10 or W3/8	4 pieces
Nut	M10 or W3/8	12 pieces

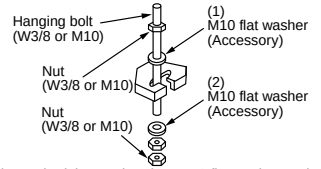
Installation of hanging bolt

Use M10 hanging bolts (4 pcs, to be local procure).
Matching to the existing structure, set pitch according to size in the unit external view as shown below.

New concrete slab	Steel flame structure	Existing concrete slab
Install the bolts with insert brackets or anchor bolts.	Use existing angles or install new support angles.	Use a hole-in anchors, hole-in plugs, or a hole-in bolts.
		

Installation of indoor unit

- Attach the nuts (M10 or W3/8: Procured locally) and the attached washers (Ø34) to the hanging bolt.
- Put washers at up and down of T-groove of the hanging bracket of the indoor unit to hang down the indoor unit.
- Using a level vial, check that four sides are horizontal. (Horizontal degree: Within 5mm)



(1) Required those other than M10 flat washer at site.
(2) To prevent falling-off of bolt (safety), be sure to set it just under the hanging bracket as shown in the figure.

5 DRAIN PIPING WORK

⚠ CAUTION

- **Following the Installation Manual, perform the drain piping work so that water is properly drained, and apply a heat insulation so as not to cause a dew. Inappropriate piping work may result in water leakage in the room and wet of furniture.**

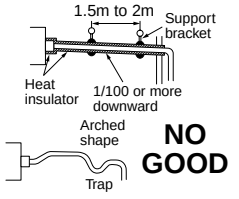
Pipe material/Insulator and size

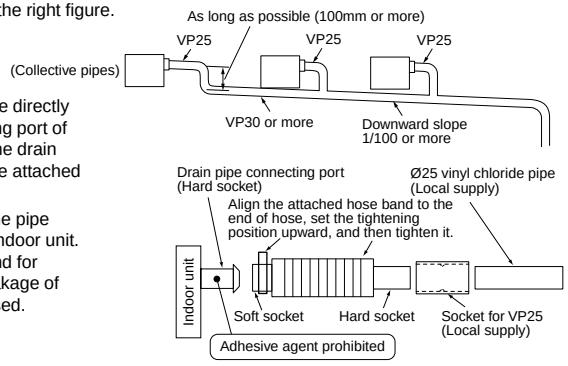
The following materials for piping work and insulating process are procured locally.

Pipe material	Hard vinyl chloride pipe socket for VP25
	Hard vinyl chloride pipe VP25 (Nominal outer diameter Ø32mm)
Insulator	Foamed polyethylene foam, thickness: 10mm or more

REQUIREMENT

- Be sure to perform heat insulation of the drain pipes of the indoor unit.
- Never forget to perform heat insulation of the connecting part with the indoor unit. An incomplete heat insulation causes dewing.
- Set the drain pipe with downward slope (1/100 or more), and do not make swelling or trap on the piping. It may cause an abnormal sound.
- For length of the traversing drain pipe, restrict to 20m or less. In case of a long pipe, provide support brackets with interval of 1.5 to 2m in order to prevent waving.
- Set the collective piping as shown in the right figure.
- Do not mount an air purge pipe, otherwise drain water spouts out resulted in water leak.
- The hard vinyl-chloride pipe cannot be directly connected to the drain pipe connecting port of the indoor unit. For connection with the drain pipe connecting port, be sure to fix the attached flexible hose.
- Adhesive agent cannot be used for the pipe connecting port (hard socket) of the indoor unit. Be sure to use the attached hose band for fixing, otherwise damage or water leakage of the drain pipe connecting port is caused.



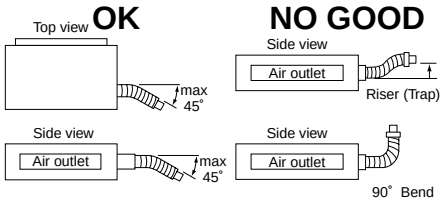

As long as possible (100mm or more)
VP25
VP25
VP25
(Collective pipes)
VP30 or more
Downward slope 1/100 or more
Drain pipe connecting port (Hard socket)
Ø25 vinyl chloride pipe (Local supply)
Align the attached hose band to the end of hose, set the tightening position upward, and then tighten it.
Indoor unit
Soft socket
Hard socket
Socket for VP25 (Local supply)
Adhesive agent prohibited

Connection of flexible hose

- Insert the soft socket of the attached flexible hose into the connecting port of the drain pipe until it strikes against the end.
- Align the attached hose band to the end of the pipe connecting port, and then tighten it surely.

REQUIREMENT

- **Be sure to fix the soft socket with the attached hose band and set the tightening position at upper side.**
- **Use the attached flexible hose by bending it with 45° or less so that no breakage or clogging occurs.**



Connection of drain pipe

- Connect the hard socket (local supply) to the hard socket side of the attached flexible hose which has been installed.
- Connect the drain pipes (local supply) successively to the connected the hard socket.

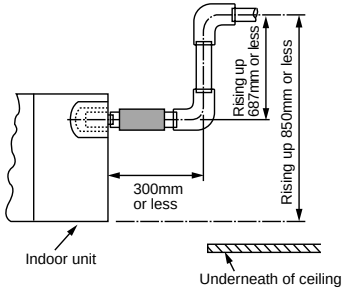
REQUIREMENT

- Using adhesive agent for vinyl chloride, connect the hard vinyl chloride pipes certainly so that water does not leak.
- It requires several times to dry and harden the adhesive agent. (Refer to Guide Manual of the adhesive agent.) In this time, be sure not to apply force to the connecting section with the drain pipes.

Drain up

When a downward grading cannot be secured on the drain pipe, a drain-up work is possible.

- Set the height of the drain pipe within 850mm from the bottom surface of the indoor unit.
- Draw out the drain pipe within 300mm from the end of the drain pipe connecting port of the indoor unit, and then raise it vertically.
- After the drain pipe has been raised, set a grading so that it is immediately bent downward.



Check the draining

After drain piping work, check that water drain is properly performed and water does not leak from the connecting part of the pipes. In this time, check also there is no abnormal sound of the motor of the drain pump. Be sure to check draining when installed in the heating period.

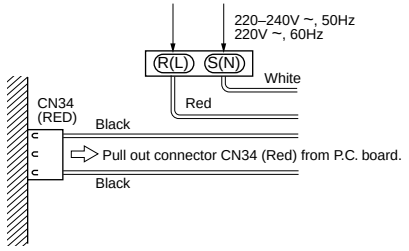
When the electric work has finished:

- Pour water as shown in the following figure, check water is drained from the drain pipe connecting port in COOL mode, and then check there is no water leak from the drain pipes.

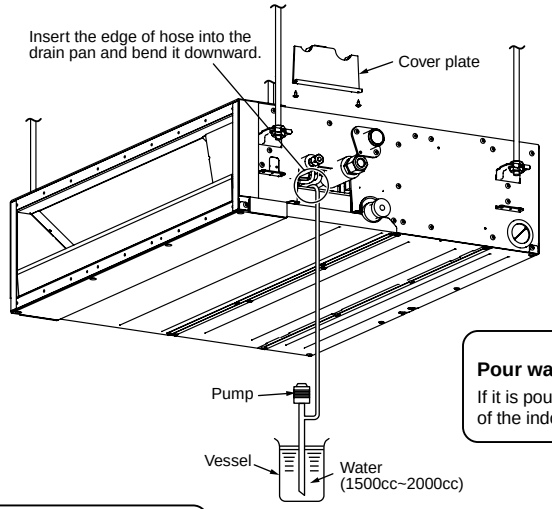
When the electric work has not finished:

- Pull out the float switch connector (3P: Red) from P.C. board connector (CN34: Red) of the electric parts box. (In this time, be sure to check the power is turned off.)
- Connect the single-phase 220-240V 50Hz (or 220V 60Hz) power to the terminal blocks R (L) and S (N). (Never apply 220-240V to (A), (B), (U1),and (U2), otherwise a trouble of P.C. board occurs.)
- Pour water referring to the figure. (Amount: 1500cc to 2000cc)
- When the power is turned on, the drain pump motor drives automatically.

  Check water is drained from the drain pipe connecting port, and then check there is no water leak from the drain pipes.
- After check of draining and water leak, turn off the power supply, attach the float switch connector to the original position (CN34) of P.C. board, and then set the electric parts box as before.



5 DRAIN PIPING WORK



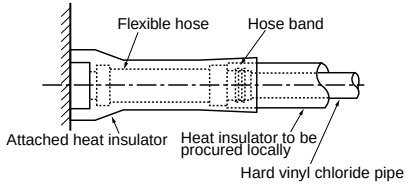
⚠ CAUTION

Pour water slowly.

If it is poured urgently, water is spread inside of the indoor unit resulted in a trouble.

Heat insulating process

- After drain check, using the attached heat insulator for drain connecting section, wrap the flexible hose without clearance from the end of the drain pipe connecting port of the indoor unit.
- Covering the attached heat insulator for drain connecting section, wrap the drain pipe with heat insulator (local supply) without clearance.

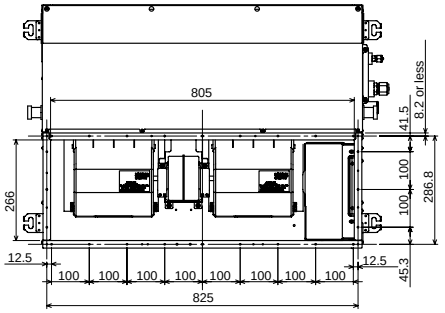


6 AIR DUCTING

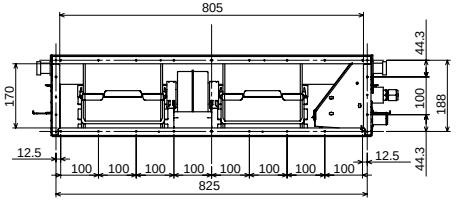
6-1. Arrangement

Referring to the following dimensions, manufacture duct at the local site.

<Under air inlet>

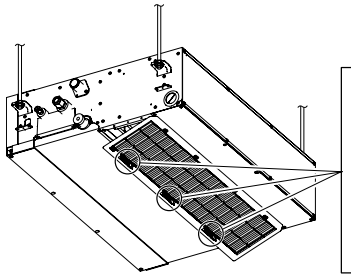


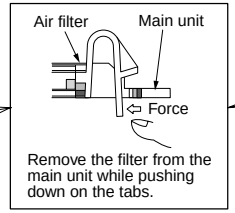
<Back air inlet>



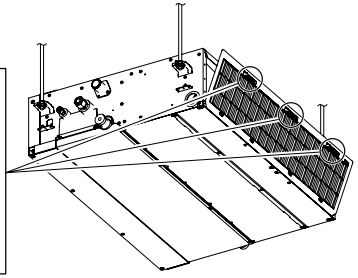
Be sure to mount an air filter to the air inlet side; otherwise decrease of capacity and etc. may be caused.

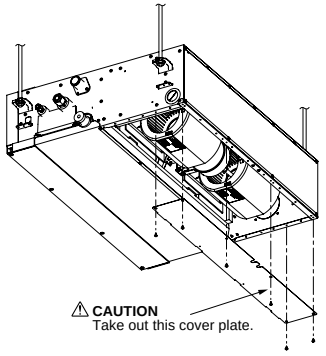
<Under air inlet>

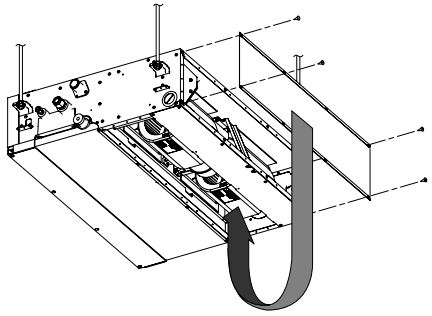




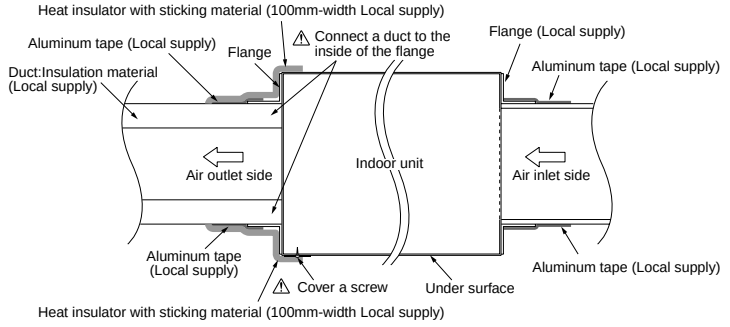
<Back air inlet>







6-2. Connecting method of the duct


Heat insulator with sticking material (100mm-width Local supply)
Aluminum tape (Local supply)
Flange
⚠ Connect a duct to the inside of the flange
Flange (Local supply)
Duct:Insulation material (Local supply)
Aluminum tape (Local supply)
Air outlet side
Indoor unit
Air inlet side
Aluminum tape (Local supply)
Aluminum tape (Local supply)
⚠ Cover a screw
Under surface
Heat insulator with sticking material (100mm-width Local supply)

⚠ CAUTION

Incomplete heat insulation of the supply air flange and sealing may occur dewing resulted in falling of water drop.

7 REFRIGERANT PIPING

⚠ WARNING

- **If refrigerant gas has leaked during the installation work, ventilate the room immediately.**
- If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.
- **After the installation work, confirm that refrigerant gas does not leak.**
- If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas may generate.

REQUIREMENT

When the refrigerant pipe is long, set the support brackets to fix the pipe with 2.5 to 3m intervals. If the pipe is not fixed, abnormal sound may generate.
Be sure to use the flare nuts attached to the indoor unit or those fro R410A.

Permissible pipe length and permissible height difference

They are different according to the used outdoor unit. For details, refer to the Installation Manual attached to the outdoor unit.

Piping material and dimensions

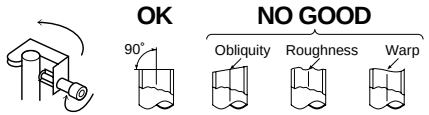
Piping material		Phosphor deoxidization joint-less pipe for air conditioner	
Model MMD-		AP007 to AP012	AP015 to AP018
Pipe size (mm)	Gas side	Ø9.5	Ø12.7
	Liquid side	Ø6.4	Ø6.4

- Use a clean and new pipe, and check that impurity such as dust, oil, moisture, etc. does not adhere in the pipe.

Pipe forming/End positioning

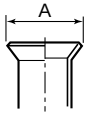
Flaring

1. Cut the pipe with a pipe cutter.



2. Insert a flare nut into the pipe, and flare the pipe.
   As the flaring sizes of R410A differ from those of refrigerant R22, the flare tools newly manufactured for R410A are recommended.
   However, the conventional tools can be used by adjusting projection margin of the copper pipe.

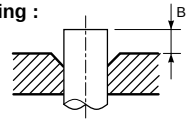
- **Flaring diam. meter size : A (Unit : mm)**



Outer diam. of copper pipe	$A^{+0}_{-0.4}$
	R410A
6.4	9.1
9.5	13.2
12.7	16.6

∗ In case of flaring for R410A with the conventional flare tool, pull it out approx. 0.5 mm more than that for R22 to adjust to the specified flare size.
The copper pipe gauge is useful for adjusting projection margin size.

- **Projection margin in flaring : B (Unit : mm)**



Rigid (Clutch type)

Outer diam. of copper pipe	R410A tool used		Conventional tool used	
	R410A	R22	R410A	R22
6.4	0 to 0.5	(Same as left)	1.0 to 1.5	0.5 to 1.0
9.5	0 to 0.5	(Same as left)	1.0 to 1.5	0.5 to 1.0
12.7	0 to 0.5	(Same as left)	1.0 to 1.5	0.5 to 1.0

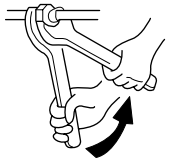
Imperial (Wing nut type)

Outer diam. of copper pipe	R410A	R22
6.4	1.5 to 2.0	1.0 to 1.5
9.5	1.5 to 2.0	1.0 to 1.5
12.7	2.0 to 2.5	1.5 to 2.0

Connection of refrigerant pipe

Connect all the refrigerant pipes with flare connecting work.

- Since the atmospheric pressure only is sealed as the sealing gas, it is not abnormal that "Pushu…" sound is not heard when the flare nut is removed.
- Be sure to use a double spanner for pipe connecting work of the indoor unit.



Work using double spanner

- Refer to the following table for tightening torque.

Connecting pipe outer dia. (mm)	Tightening torque (N•m)	Re-tightening torque (N•m)
Ø6.4	14 to18 (1.4 to 1.8 kgf•m)	18 (1.8 kgf•m)
Ø9.5	33 to 42 (3.3 to 4.2 kgf•m)	42 (4.2 kgf•m)
Ø12.7	50 to 62 (5.0 to 6.2 kgf•m)	62 (6.2 kgf•m)

- **Tightening torque of flare pipe connections**
  Pressure of R410A is higher than that of R22 by approx. 1.6 times. Therefore, using a torque wrench, tighten the flare pipe connecting sections which connect the indoor and outdoor units of the specified tightening torque. Incorrect connections may cause not only a gas leak, but also a trouble of the refrigerating cycle.

REQUIREMENT

If an excessive torque is applied, the nut may crack depending on the installation conditions.

Airtight test/Air purge, etc.

For airtight test, air purge, addition of refrigerant, and gas leak check, follow the Installation Manual attached to the outdoor unit.

REQUIREMENT

Be sure to use the tool such as charge hose exclusive to R410A.
Do not turn on the power until the airtight test and the vacuuming have finished. (If turning on the power, the incorporated PMV is closed fully and the period until the vacuuming finishes elongates.

Open fully valves of the outdoor unit

Gas leak check

Check with a leak detector or soap water whether gas leaks or not, from the pipe connecting section or cap of the valve.

REQUIREMENT

Use a leak detector manufactured exclusively for HFC refrigerant (R410A, R134a, etc.).

7 REFRIGERANT PIPING

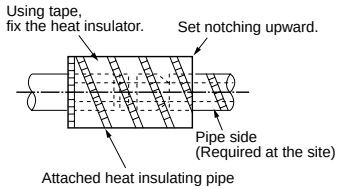
Heat insulating process

Perform heat insulating for pipes at liquid side and gas side separately.
In cooling time, temperature at both liquid and gas sides becomes lower.
Therefore, perform heat insulating process sufficiently to avoid dewing.

- For heat insulator of pipe at gas side, be sure to use one with heat-resisting temp.120°C or more.
- Using the attached heat insulating pipe, perform heat insulating process securely for pipe connecting part of the indoor units without clearance.

REQUIREMENT

Apply the heat insulation to the pipe connecting section of the indoor unit securely up to the root without exposure of the pipe.
(The pipe exposed to the outside causes water leak.)



8 ELECTRIC WORK

⚠ WARNING

1. **Using the specified wires, ensure to connect the wires, and fix wires securely so that the external strength of the wires do not transmit to the connecting part of the terminals.**
   Incomplete connection or fixation may cause a fire, etc.
2. **Be sure to connect earth wire. (Grounding work)**
   Do not connect the earth wire to gas pipe, city water pipe, lightning rod, or the earth wire of telephone. Incomplete grounding causes an electric shock.
3. **For electric work, strictly follow to the Local Regulation in each country and the Installation Manual, and use an exclusive circuit.**
   Capacity shortage of power circuit or incomplete installation may cause an electric shock or a fire.

⚠ CAUTION

Be sure to install an earth leakage breaker.
If an earth leakage breaker is not installed, an electric shock may be caused.

REQUIREMENT

- For power supply wiring, strictly conform to the Local Regulation in each country.
- For wiring of power supply of the outdoor units, follow to the Installation Manual of each outdoor unit.
- Never connect 220–240V power to the terminal blocks (A, B, U1, U2, X, Y, etc.) for control wiring. (Otherwise, the system will be failed.)
- Perform the electric wiring so that it does not come to contact with the high-temperature part of the pipe. The coating may melt resulted in an accident.
- After connecting wires to the terminal blocks, provide a trap and fix wires with the wire clamp.
- Store the refrigerant piping line and control wiring line in the same line.
- Do not turn on the power of the indoor unit until vacuuming of the refrigerant pipes completes.

Power supply cord and communication wires specifications

Power supply cord and communication wires are procured locally.

For the power supply specifications, follow to the table below. If capacity is little, it is dangerous because overheat or seizure may be caused.

For specifications of the power capacity of the outdoor unit and the power supply wires, refer to the Installation Manual attached to the outdoor unit.

Indoor unit power supply

- For the power supply of the indoor unit, prepare the exclusive power supply separated from that of the outdoor unit.
- Arrange the power supply, earth leakage breaker, and main switch of the indoor unit connected to the same outdoor unit so that they are commonly used.
- Power supply cord specification : Cable 3-core 2.5mm², **in conformity with Design 60245 IEC 57**.

Power supply	Power supply		220–240V ~ 50Hz 220V ~ 60Hz
	Power supply switch/Earth leakage breaker or power supply wiring/fuse rating for indoor units should be selected by the accummulated total current values of the indoor units.		
	Power supply wiring	Below 20m	Twist wire : 2.0 mm²
		Below 50m	Twist wire : 3.5 mm²

Control wiring, Central controller wiring

- 2-core with polarity wires are used for the Control wiring between indoor unit and outdoor unit and Central controller wiring.
- To prevent noise trouble, use 2-core shield wire.
- The length of the communication line means the total length of the inter-unit wire length between indoor and outdoor units added with the central control system wire length.

Communication line	Control wiring between indoor unit and outdoor unit (2-core shield wire)	Wire size	(Up to 1000m) Twist wire : 1.25 mm² (Up to 2000m) Twist wire : 2.0 mm²
	Central control line wiring (2-core shield wire)	Wire size	(Up to 1000m) Twist wire : 1.25 mm² (Up to 2000m) Twist wire : 2.0 mm²

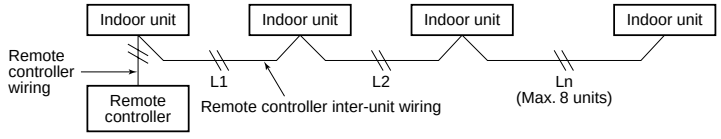
Remote controller wiring

- 2-core with non-polarity wire is used for wiring of the remote controller wiring and group remote controllers wiring.

Remote controller wiring, remote controller inter-unit wiring	Twist wire: 0.5mm² to 2.0mm² × 2	
Total wire length of remote controller wiring and remote controller inter-unit wiring = L + L1 + L2 + … Ln	In case of wired type only	Up to 500m
	In case of wireless type included	Up to 400m
Total wire length of remote controller inter-unit wiring = L1 + L2 + … Ln		Up to 200m

CAUTION

The remote controller wire (Communication line) and AC220–240V wires cannot be parallel to contact each other and cannot be stored in the same conduits. If doing so, a trouble may be caused on the control system due to noise, etc.



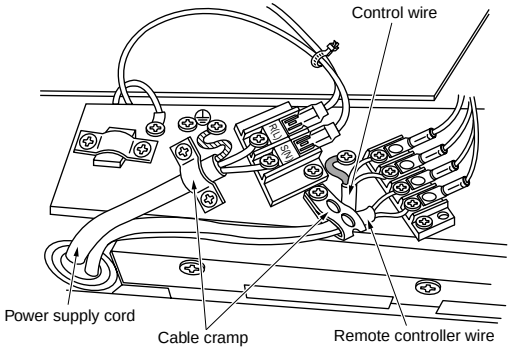
8 ELECTRIC WORK

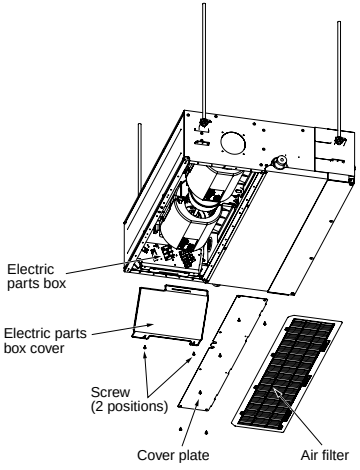
Cable connection

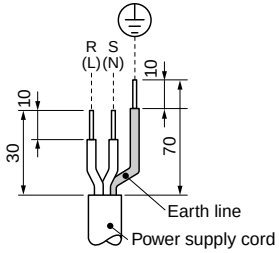
REQUIREMENT

- Be sure to pass the wire through the wire connection port of the indoor unit.
- Keep a margin (Approx. 100mm) on a wire to hang down the electric parts box at servicing, etc.
- The low-voltage circuit is provided for the remote controller.

- Before remove the electric parts cover, remove the cover plate and air filter.
- Remove the cover of the electric parts box by taking off the mounting screws (2 positions) and pushing the hooking section. (The cover of the electric parts box remains hanged to the hinge.)
- Tighten the screws of the terminal block, and fix the wires with cord clamp attached to the electric parts box. (Do not apply tension to the connecting section of the terminal block.)
- Be sure to set a loop for the connecting wire of the storing part of the indoor unit electric parts; otherwise the electric parts box cannot be drawn out in service time.
- Mount the cover of the electric parts box without pinching wires.



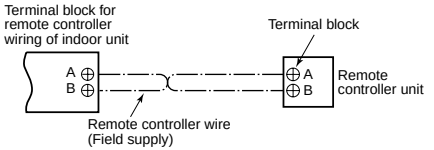




Remote controller wiring

- As the remote controller wire has no polarity, there is no problem if connections to indoor unit terminal blocks A and B are reversed.

<Wiring diagram>

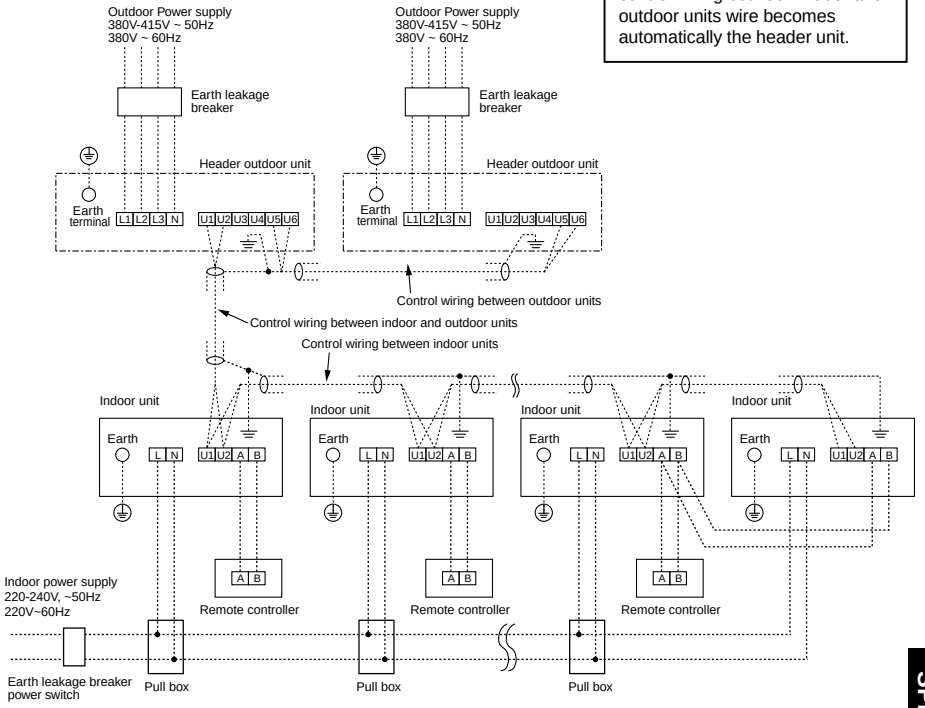


Wiring between indoor and outdoor units

<Wiring example>

NOTE

An outdoor unit connected with control wiring between indoor and outdoor units wire becomes automatically the header unit.


Outdoor Power supply 380V-415V ~ 50Hz 380V ~ 60Hz
Outdoor Power supply 380V-415V ~ 50Hz 380V ~ 60Hz
Earth leakage breaker
Earth leakage breaker
Header outdoor unit
Header outdoor unit
Earth terminal
L1 L2 L3 N
U1 U2 U3 U4 U5 U6
Control wiring between outdoor units
Control wiring between indoor and outdoor units
Control wiring between indoor units
Indoor unit
Earth
L N U1 U2 A B
Remote controller
Indoor power supply 220-240V, ~50Hz 220V~60Hz
Earth leakage breaker power switch
Pull box

Address setup

Set up the addresses according to the Installation Manual attached to the outdoor unit.

9 APPLICABLE CONTROLS

NOTIFICATION

When using the equipment at the first time, it will take a lot of time that the remote controller accepts an operation after power was on. However, it is not a trouble.

- **Automatic address**
  - While automatic addressing, the operation cannot be performed on the remote controller.
  - For automatic addressing, Max. 10 minutes (generally, approx. 5 minutes) are required.
- **When power will be turned on after finish of automatic addressing;**
  - It will require Max. 10 minutes (generally, approx. 3 minutes) that outdoor unit starts operation after power was on.

As all have been set to [Standard] at the shipment, change the setup of the indoor unit if necessary.

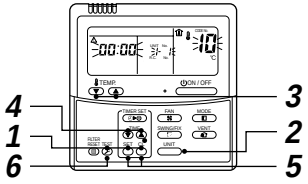
To change the setup, use the main remote controller (wired remote controller).

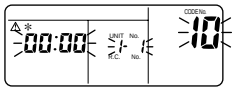
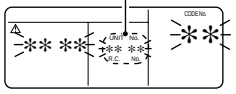
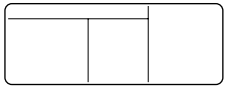
* The setup change for wireless remote controller, sub remote controller, or remote controller-less system (Central control remote controller only is provided.) is impossible. In these cases, prepare and mount a separate main remote controller.

Exchange of applicable control setup

Basic operation procedure for setup exchange

Change the setup while operation of the equipment stops.
(Be sure to stop the operation of a set.)



Procedure	Description
1	When pushing SET, CL, and TEST buttons simultaneously for 4 seconds or more, after a while, the display part flashes as shown in the figure. Check that the displayed item code is [10]. • If the item code indicates other than [10], push TEST button to erase the display, and then retry the operation from the first step. (For some time after TEST button has been pushed, the operation of the remote controller cannot be accepted.) (In a group control, the firstly displayed indoor unit No. becomes the header unit.)  (* The display changes according to the indoor unit model.)
2	Every pushing UNIT button, the indoor unit No. in the group control is displayed successively. Select an indoor unit of which setup to be changed. In this time, the position of the indoor unit of which setup to be changed can be confirmed because the fan and the flap of the selected indoor unit work.
3	Using ▼, ▲ buttons of set temperature, specify the item code [**].
4	Using ▼, ▲ buttons of timer time, select set data [****]. 
5	Push SET button. In this time, if the display changes from flashing to lighting, the setup completes. • To change the setup of an indoor unit other than the selected one, start operation from Procedure ***2***. • To change the setup of another setup in the selected indoor unit, start operation from Procedure ***3***. Pushing CL button clears the set up contents which have been already set. In this case, retry from Procedure ***2***.
6	When the setup finished, push TEST button. (The setup is determined.) Pushing TEST button deletes the display and returns the status to normal stop status. (For some time after TEST button has been pushed, the operation of the remote controller cannot be accepted.) 

Setup of external static pressure

Be sure to set up a tap change based upon the resistance (external static pressure) of the duct to be connected.

To set up a tap change, follow to the basic operation procedure (***1*** → ***2*** → ***3*** → ***4*** → ***5*** → ***6***).

- Specify [5d] to the item code in procedure ***3***.
- For the setup data of procedure ***4***, select a setup data of the external static pressure to be set up from the following table.

<Change on wired remote controller>

Setup data	External static pressure	
0000	10 Pa	Standard (At shipment)
0001	20 Pa	High static pressure 1
0003	35 Pa	High static pressure 2
0006	50 Pa	High static pressure 3

In case of remote controller-less (Group control)

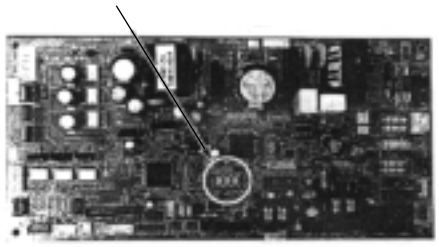
For setup to the high ceiling, there is selecting method by exchanging the short plugs on the indoor microcomputer P.C. board as shown in the following table other than selecting method by standard wired remote controller (sold separately). Utilize this method for remote controller-less (Group control) case.

∗ However, when the setup to high ceiling has been once exchanged, it is required for returning it to 0000 to change the short plug to the standard (at shipment) position and rewrite data to the setup data 0000 from the wired remote controller sold separately though setup to 0001, 0003 or 0006 are freely available.

- **Select by exchange of short plugs on the indoor P.C. board.**

Short plug position Short Open	Set data	External static pressure
CN112 CN111 CN110	**0000**	10 Pa (At shipment)
CN112 CN111 CN110	**0001**	20 Pa
CN112 CN111 CN110	**0003**	35 Pa
CN112 CN111 CN110	**0006**	50Pa

- **Short plug position (CN112, CN111, CN110 from the left)**



9 APPLICABLE CONTROLS

Change of lighting term of filter sign

According to the installation condition, the lighting term of the filter sign (Notification of filter cleaning) can be changed.

Follow to the basic operation procedure
(***1*** → ***2*** → ***3*** → ***4*** → ***5*** → ***6***).

- For the item code in Procedure ***3***, specify [01].
- For the [Set data] in Procedure ***4***, select the setup data of filter sign lighting terme from the following table.

Setup data	Filter sign lighting term
0000	None
0001	150H
0002	2500H (At shipment from factory)
0003	5000H
0004	10000H

To secure better effect of heating

When it is difficult to obtain satisfactory heating due to installation place of the indoor unit or structure of the room, the detection temperature of heating can be raised. Also use a circulator, etc. to circulate heat air near the ceiling.

Follow to the basic operation procedure
(***1*** → ***2*** → ***3*** → ***4*** → ***5*** → ***6***).

- For the item code in Procedure ***3***, specify [06].
- For the set data in Procedure ***4***, select the setup data of shift value of detection temperature to be set up from the table below.

Setup data	Detection temp shift value
0000	No shift
0001	+1°C
0002	+2°C (At shipment from factory)
0003	+3°C
0004	+4°C
0005	+5°C
0006	+6°C

Group control

In a group control, a remote controller can control up to maximum 8 units.

- For cabling procedure and cables of the individual line (Identical refrigerant line) system, refer to "Electric work" in this Manual.
- Cabling between indoor units in a group is performed in the following procedure.

  Connect the indoor units by connecting the remote controller inter-unit cables from the remote controller terminal blocks (A, B) of the indoor unit connected with a remote controller to the remote controller terminal blocks (A, B) of the other indoor unit. (No polarity)
- For address setup, refer to the Installation Manual attached to the outdoor unit.

10 TEST RUN

Before test operation

WARNING

To protect the compressor at starting time, keep power-ON condition before 12 hours or more.

- Before turning on the power supply, carry out the following items.
  1) Using 500V-megger, check there is 1MΩ or more between the terminal block of the power supply and the earth. If 1MΩ or less is detected, do not run the unit.
  2) Check that all the valves of the outdoor unit are fully opened.
- Never push the electromagnetic contactor to carry out a forced test operation. (It is very dangerous because a protective device does not work.)

How to execute test operation

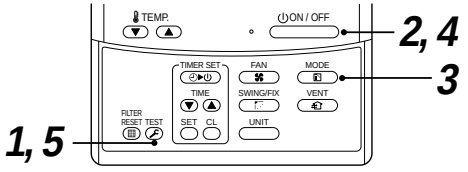
- To carry out a fan operation in a single indoor unit, turn off the power once, short CN72 on P.C. board, and then turn on the power again. (Start the unit in FAN mode.) In this case, do not forget to clear short-circuit of CN72 after test operation.
- Using the remote controller, check the operation in the usual operation. For the operation procedure, refer to the attached Owner's Manual.

  A forced test operation can be executed in the following procedure under condition of thermo-OFF of room temperature.

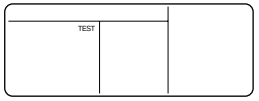
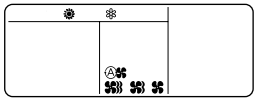
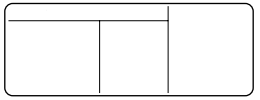
  In order to prevent a serial operation, the forced test operation is released after 60 minutes and returns to the usual operation.

NOTE

Do not use a forced operation in cases other than test operation because it applies an excessive load to the air conditioner.



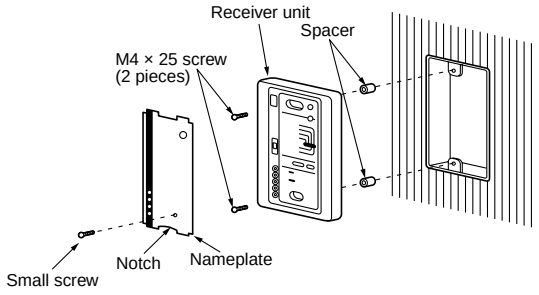
In case of wired remote controller

Procedure	Description	
1	Keep TEST button pushed for 4 seconds or more. [TEST] is displayed on the display part and the selection of mode in the test mode is permitted.	
2	Push ON / OFF button.	
3	Using MODE button, select the operation mode, [COOL] or [HEAT]. • Do not run the air conditioner in a mode other than [COOL] or [HEAT]. • The temperature controlling function does not work during test operation. • The detection of error is performed as usual.	
4	After the test operation, push ON / OFF button to stop the operation. (Display part is same as procedure ***1***)	
5	Push TEST button to cancel (release from) the test operation mode. ([TEST] disappears on the display part and the status returns to a normal stop status.)	

10 TEST RUN

In case of wireless remote controller

Procedure	Description
1	Remove a small screw which fixes the nameplate of the receiver unit. Remove the nameplate of the sensor section by inserting a minus screwdriver, etc into the notch at the bottom of the plate, and set the Dip switch to [TEST RUN ON].
2	Execute a test operation with button on the wireless remote controller. • (⏻), (◴), and (❋) LED flash during test operation. • Under status of [TEST RUN ON], the temperature adjustment from the wireless remote controller is invalid. Do not use this method in the operation other than test operation because the equipment is damaged.
3	Use either COOL or HEAT operation mode for a test operation. * The outdoor unit does not operate approx. 3 minutes after power-ON and operation stop.
4	After the test operation finished, stop the air conditioner from the wireless remote controller, and return Dip switch of the receiver section as before. (A 60-minutes timer clearing function is attached to the receiver section in order to prevent a continuous test operation.)



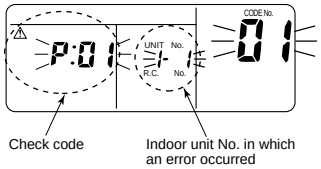
11 TROUBLESHOOTING

Confirmation and check

When a trouble occurred in the air conditioner, the check code and the indoor unit No. appear on the display part of the remote controller.

The check code is only displayed during the operation.

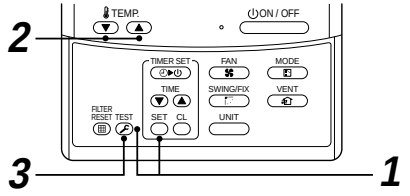
If the display disappears, operate the air conditioner according to the following “Confirmation of error history” for confirmation.

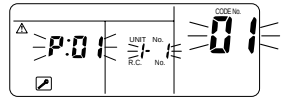


Confirmation of error history

When a trouble occurred on the air conditioner, the error history can be confirmed with the following procedure.
(The error history is stored in memory up to 4 errors.)

This history can be confirmed from either operating status or stop status.



Procedure	Description	
1	When pushing SET and TEST buttons simultaneously for 4 seconds or more, the right display appears. If [Service Check] is displayed, the mode enters in the error history mode. • [01: Order of error history] is displayed in CODE No. window. • [Check Code] is displayed in CHECK window. • [Indoor unit address in which an error occurred] is displayed in UNIT No.	
2	Every pushing (▼), (▲) buttons, the error history stored in the memory is displayed in order. The numbers in CODE No. indicates CODE No. [01] (Latest) → [04] (Oldest). **CAUTION** Do not push CL button because all the error history of the indoor unit will be deleted.	
3	After confirmation, push TEST button to return to the usual display.	

11 TROUBLESHOOTING

Check method

On the remote controller (Main remote controller, Central control remote controller) and the interface P.C. board of the outdoor unit (I/F), a check display LCD (Remote controller) or 7-segment display (on the outdoor interface P.C. board) to display the operation is provided. Therefore the operation status can be known. Using this self-diagnosis function, a trouble or position with error of the air conditioner can be found as shown in the table below.

Check code list

The following list shows each check code. Find the check contents from the list according to part to be checked.
- In case of check from indoor remote controller: See “Main remote controller display” in the list.
- In case of check from outdoor unit: See “Outdoor 7-segment display” in the list.
- In case of check from AI-NET central control remote controller: See “AI-NET central control display” in the list.
- In case of check from indoor unit with wireless remote controller: See “Sensor block display of receiving unit” in the list.

Terminology

AI-NET : Artificial Intelligence.
IPDU : Intelligent Power Drive Unit
○ : Lighting, ¤ : Flashing, ● : Goes off
ALT. : Flashing is alternately when there are two flashing LED.
SIM : Simultaneous flashing when there are two flashing LED.

Check code				Wireless remote controller					
Main remote controller display	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit				Check code name	Judging device
		Auxiliary code		Operation	Timer	Ready	Flash		
E01	—	—	—	¤	●	●		Communication error between indoor and remote controller (Detected at remote controller side)	Remote controller
E02	—	—	—	¤	●	●		Remote controller transmission error	Remote controller
E03	—	—	97	¤	●	●		Communication error between indoor and remote controller (Detected at indoor side)	Indoor
E04	—	—	04	●	●	¤		Communication circuit error between indoor/ outdoor (Detected at indoor side)	Indoor
E06	E06	No. of indoor units in which sensor has been normally received	04	●	●	¤		Decrease of No. of indoor units	I/F
—	E07	—	—	●	●	¤		Communication circuit error between indoor/ outdoor (Detected at outdoor side)	I/F
E08	E08	Duplicated indoor addresses	96	¤	●	●		Duplicated indoor addresses	Indoor / I/F
E09	—	—	99	¤	●	●		Duplicated main remote controllers	Remote controller
E10	—	—	CF	¤	●	●		Communication error between indoor MCU	Indoor
E12	E12	01: Indoor/Outdoor communication 02: Communication between outdoor units	42	¤	●	●		Automatic address start error	I/F
E15	E15	—	42	●	●	¤		Indoor is nothing during automatic addressing	I/F
E16	E16	00: Capacity over 01 ~:No. of connected units	89	●	●	¤		Capacity over / No. of connected indoor units	I/F
E18	—	—	97, 99	¤	●	●		Communication error between indoor units	Indoor
E19	E19	00: Header is nothing 02: Two or more header units	96	●	●	¤		Outdoor header units quantity error	I/F
E20	E20	01: Outdoor of other line connected 02: Indoor of other line connected	42	●	●	¤		Other line connected during automatic address	I/F
E23	E23	—	15	●	●	¤		Sending error in communication between outdoor units	I/F
E25	E25	—	15	●	●	¤		Duplicated follower outdoor addresses	I/F
E26	E26	No. of outdoor units which received signal normally	15	●	●	¤		Decrease of No. of connected outdoor units	I/F
E28	E28	Detected outdoor unit number	d2	●	●	¤		Follower outdoor unit error	I/F
E31	E31	01: IPDU1 error 02: IPDU2 error 03: IPDU1, 2 error 04: Fan IPDU error 05: IPDU + Fan IPDU error 06: IPDU2 + Fan IPDU error 07: All IPDU error	CF	●	●	¤		IPDU communication error	I/F

Check code				Wireless remote controller					
Main remote controller display	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit				Check code name	Judging device
		Auxiliary code		Operation	Timer	Ready	Flash		
F01	—	—	0F	¤	¤	●	ALT	Indoor TCJ sensor error	Indoor
F02	—	—	0d	¤	¤	●	ALT	Indoor TC2 sensor error	Indoor
F03	—	—	93	¤	¤	●	ALT	Indoor TC1 sensor error	Indoor
F04	F04	—	19	¤	¤	○	ALT	TD1 sensor error	I/F
F05	F05	—	A1	¤	¤	○	ALT	TD2 sensor error	I/F
F06	F06	—	18	¤	¤	○	ALT	TE1 sensor error	I/F
F07	F07	—	18	¤	¤	○	ALT	TL sensor error	I/F
F08	F08	—	1b	¤	¤	○	ALT	TO sensor error	I/F
F10	—	—	OC	¤	¤	●	ALT	Indoor TA sensor error	Indoor
F12	F12	—	A2	¤	¤	○	ALT	TS1 sensor error	I/F
F13	F13	01: Comp. 1 side 02: Comp. 2 side	43	¤	¤	○	ALT	TH sensor error	IPDU
F15	F15	—	18	¤	¤	○	ALT	Outdoor temp. sensor miscabling (TE, TL)	I/F
F16	F16	—	43	¤	¤	○	ALT	Outdoor pressure sensor miscabling (Pd, Ps)	I/F
F23	F23	—	43	¤	¤	○	ALT	Ps sensor error	I/F
F24	F24	—	43	¤	¤	○	ALT	Pd sensor error	I/F
F29	—	—	12	¤	¤	●	SIM	Indoor other error	Indoor
F31	F31	—	1C	¤	¤	○	SIM	Indoor EEPROM error	I/F
H01	H01	01: Comp. 1 side 02: Comp. 2 side	IF	●	¤	●		Compressor break down	IPDU
H02	H02	01: Comp. 1 side 02: Comp. 2 side	1d	●	¤	●		Magnet switch error Overcurrent relay operation Compressor trouble (lock)	MG-SW Overcurrent relay IPDU
H03	H03	01: Comp. 1 side 02: Comp. 2 side	17	●	¤	●		Current detect circuit system error	IPDU
H04	H04	—	44	●	¤	●		Comp 1 case thermo operation	I/F
H06	H06	—	20	●	¤	●		Low pressure protective operation	I/F
H07	H07	—	d7	●	¤	●		Oil level down detective protection	I/F
H08	H08	01: TK1 sensor error 02: TK2 sensor error 03: TK3 sensor error 04: TK4 sensor error	d4	●	¤	●		Oil level detective temp sensor error	I/F
H14	H14	—	44	●	¤	●		Comp 2 case thermo operation	I/F
H16	H16	01: TK1 oil circuit system error 02: TK2 oil circuit system error 03: TK3 oil circuit system error 04: TK4 oil circuit system error	d7	●	¤	●		Oil level detective circuit error Magnet switch error Overcurrent relay operation	I/F MG-SW Overcurrent relay
L03	—	—	96	¤	●	¤	SIM	Indoor center unit duplicated	Indoor
L04	L04	—	96	¤	○	¤	SIM	Outdoor line address duplicated	I/F
L05	—	—	96	¤	●	¤	SIM	Duplicated indoor units with priority (Displayed in indoor unit with priority)	I/F
L06	L06	No. of indoor units with priority	96	¤	●	¤	SIM	Duplicated indoor units with priority (Displayed in unit other than indoor unit with priority)	I/F
L07	—	—	99	¤	●	¤	SIM	Group line in individual indoor unit	Indoor
L08	L08	—	99	¤	●	¤	SIM	Indoor group/Address unset	Indoor, I/F
L09	—	—	46	¤	●	¤	SIM	Indoor capacity unset	Indoor
L10	L10	—	88	¤	○	¤	SIM	Outdoor capacity unset	I/F
L20	L20	—	98	¤	○	¤	SIM	Duplicated central control addresses	AI-NET, Indoor
L28	L28	—	46	¤	○	¤	SIM	Over No. of connected outdoor units	I/F
L29	L29	01: IPDU1 error 02: IPDU2 error 03: IPDU3 error 04: Fan IPDU error 05: IPDU1 + Fan IPDU error 06: IPDU2 + Fan IPDU error 07: All IPDU error	CF	¤	○	¤	SIM	No. of IPDU error	I/F
L30	L30	Detected indoor address	b6	¤	○	¤	SIM	Indoor outside interlock	Indoor
—	L31	—	—		—			Extended I/C error	I/F

11 TROUBLESHOOTING

Check code				Wireless remote controller				Check code name	Judging device
Main remote controller display	Outdoor 7-segment display	Auxiliary code	AI-NET central control display	Sensor block display of receiving unit					
				Operation	Timer	Ready	Flash		
P01	—	—	11	●	¤	¤	ALT	Indoor fan motor error	Indoor
P03	P03	—	1E	¤	●	¤	ALT	Discharge temp. TD1 error	I/F
P04	P04	01: Comp. 1 side 02: Comp. 2 side	21	¤	●	¤	ALT	High-pressure SW system operation	IPDU
P05	P05	01: Phase-missing detection 02: Phase error	AF	¤	●	¤	ALT	Phase-missing detection /Phase error	I/F
P07	P07	01: Comp. 1 side 02: Comp. 2 side	IC	¤	●	¤	ALT	Heat sink overheat error	IPDU, I/F
P10	P10	Detected indoor address	Ob	●	¤	¤	ALT	Indoor overflow error	Indoor
P12	—	—	11	●	¤	¤	ALT	Indoor fan motor error	Indoor
P13	P13	—	47	●	¤	¤	ALT	Outdoor liquid back detection error	I/F
P15	P15	01: TS condition 02: TD condition	AE	¤	●	¤	ALT	Gas leak detection	I/F
P17	P17	—	bb	¤	●	¤	ALT	Discharge temp. TD2 error	I/F
P19	P19	Detected outdoor unit number	O8	¤	●	¤	ALT	4-way valve inverse error	I/F
P20	P20	—	22	¤	●	¤	ALT	High-pressure protective operation	I/F
P22	P22	0 ⎕: IGBT short 1 ⎕: Fan motor position detective circuit error 3 ⎕: Fan motor trouble C ⎕: TH sensor temp. error (Heat sink overheat) D ⎕: TH sensor error E ⎕: Vdc output error	1A	¤	●	¤	ALT	Outdoor fan IPDU error	IPDU
P26	P26	01: Comp. 1 side 02: Comp. 2 side	14	¤	●	¤	ALT	G-TR short protection error	IPDU
P29	P29	01: Comp. 1 side 02: Comp. 2 side	16	¤	●	¤	ALT	Comp position detective circuit system error	IPDU
P31	P31	—	47	¤	●	¤	ALT	Other indoor unit error (Group terminal unit error)	Indoor
—	—	—	b7	By alarm device			ALT	Error in indoor group	AI-NET
—	—	—	97	—				AI-NET communication system error	AI-NET
—	—	—	99	—				Duplicated network adaptors	AI-NET

Error detected by TCC-LINK central control device

Check code				Wireless remote controller				Check code name	Judging device
Central control device indication	Outdoor 7-segment display	Auxiliary code	AI-NET central control display	Sensor block display of receiving unit					
				Operation	Timer	Ready	Flash		
C05	—	—	—	—				Sending error in TCC-LINK central control device	TCC-LINK
C06	—	—	—	—				Receiving error in TCC-LINK central control device	TCC-LINK
C12	—	—	—	—				Batch alarm of general-purpose equipment control interface	General-purpose equipment I/F
P30	Differs according to error contents of unit with occurrence of alarm							Group control branching unit error	TCC-LINK
	—	—	(L20 is displayed.)					Duplicated central control addresses	

Terminology

TCC-LINK : TOSHIBA Carriea Cominication Link.

New check code

1. Difference between the new check code and the current system

The displaying method of the check code changes in this model and after.

	Check code in current system	New check code
Used characters	Hexadecimal notation, 2 digits	Alphabet + Decimal notation, 2 digits
Characteristics of code classification	Few classification of communication/incorrect setup system	Many classification of communication/incorrect setup system
Block display	Indoor P.C. board, Outdoor P.C. board, Cycle, Communication	Communication/Incorrect setup (4 ways), Indoor protection, Outdoor protection, Sensor, Compressor protection, etc.

<Display on wired remote controller>

- [⚠] goes on.
- [UNIT No.] + Check code + Operation lamp (Green) flash

<Display on sensor part of wireless>

- Block display of combination of [◴] [⏻] [✺]

<Display on indicater on wiress remote controller receiver part>

- Unit No. and check code are displayed.
- In a case of error with auxiliary code, check code and auxiliary code are displayed alternately.

Display	Classification
A	Unused
C	Central control system error
E	Communication system error
F	Each sensor error (Failure)
H	Compressor protective system error
J	Unused
L	Setup error, Other errors
P	Protective device operation

12 MAINTENANCE

For maintenance, be sure to turn off the main power switch.

⚠ CAUTION

Do not handle the buttons with wet hands; otherwise an electric shock may be caused.

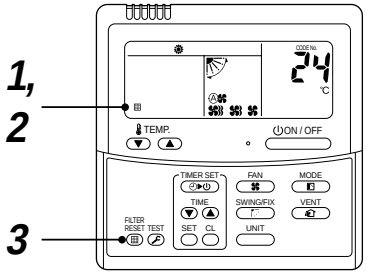
<Daily maintenance>

Cleaning of air filter

1 **If ▦ is displayed on the remote controller, contact to service on maintenance professional to cleaning the air filter.**

2 **Clogging of the air filter decreases cooling/ heating efficiency.**

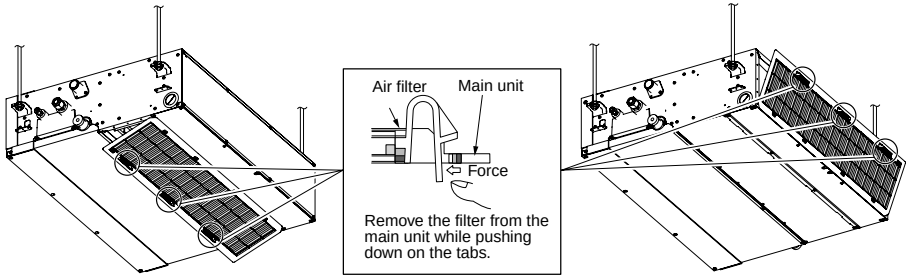
3 **After cleaning, push (▣) .**
▦ display disappears.



[Air filter cleaning method]

1 **Take out the air filter.**

- Push the tabs (Forward direction as shown in the figure) of the fir filter, and then pull out it to take out the air filter.



2 **Cleaning with water or vacuum cleaner**

- If dirt is heavy, clean the air filter by tepid water with neutral detergent or water.
- After cleaning with water, dry the air filter sufficiently in a shade place.

3 **Mount the air filter.**

- Attach the filter to the main unit while pushing the tabs (Forward direction as shown in the figure).

4 **Push (▣).**

- ▦ display disappears.

NOTE

When connecting a return air duct g to the unit, r cleaning method of the air filter differs according to the construction of duct end. Please ask the constructor for construction of air duct.

Accessory parts

❒ Accessory parts

Part name	Q'ty		Shape	Usage
	SPH model with drain pump	SH model without drain pump		
Installation Manual	1		This manual	(Be sure to hand over to customers)
Insulating pipe	2			For insulating pipe connecting section
Washer	8		M10 × Ø34	For hanging down the unit
Hose band	1	2		For connecting drain pipe
Flexible hose	1			For adjustment of drain pipe centering
Heat insulator	1			For insulating drain connecting section
Banding band	—	2		For drain hose forming

1 PRECAUTIONS FOR SAFETY

- Ensure that all Local, National and International regulations are satisfied.
- Read this "PRECAUTIONS FOR SAFETY" carefully before Installation.
- The precautions described below include the important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem.
  Follow the Owner's Manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before the unit maintenance.
- Ask the customer to keep the Installation Manual together with the Owner's Manual.

CAUTION **New Refrigerant Air Conditioner Installation**

- **THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER.**

The characteristics of R410A refrigerant are ; easy to absorb water, oxidizing membrane or oil, and its pressure is approx. 1.6 times higher than that of refrigerant R22. Accompanied with the new refrigerant, refrigerating oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle.

To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are charged from those for the conventional refrigerant.

Accordingly the exclusive tools are required for the new refrigerant (R410A).

For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter. Moreover, do not use the existing piping because there are problems with pressure-resistance force and impurity in it.

CAUTION **To Disconnect the Appliance from Main Power Supply.**

This appliance must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm.

⚠ WARNING

- **Ask an authorized dealer or qualified installation professional to install/maintain the air conditioner.**
  Inappropriate installation may result in water leakage, electric shock or fire.
- **Turn off the main power supply switch or breaker before attempting any electrical work.**
  Make sure all power switches are off. Failure to do so may cause electric shock.
- **Connect the connecting wire correctly.**
  If the connecting wire is connected in a wrong way, electric parts may be damaged.
- **When moving the air conditioner for the installation into another place, be very careful not to enter any gaseous matter other than the specified refrigerant into the refrigeration cycle.**
  If air or any other gas is mixed in the refrigerant, the gas pressure in the refrigeration cycle becomes abnormally high and it as a result causes pipe burst and injuries on persons.
- **Do not modify this unit by removing any of the safety guards or by by-passing any of the safety interlock switches.**
- **Exposure of unit to water or other moisture before installation may cause a short-circuit of electrical parts.**
  Do not store it in a wet basement or expose to rain or water.
- **After unpacking the unit, examine it carefully if there are possible damage.**
- **Do not install in a place that might increase the vibration of the unit.**
- **To avoid personal injury (with sharp edges), be careful when handling parts.**
- **Perform installation work properly according to the Installation Manual.**
  Inappropriate installation may result in water leakage, electric shock or fire.
- **When the air conditioner is installed in a small room, provide appropriate measures to ensure that the concentration of refrigerant leakage occur in the room does not exceed the critical level.**
- **Install the air conditioner securely in a location where the base can sustain the weight adequately.**
- **Perform the specified installation work to guard against an earthquake.**
  If the air conditioner is not installed appropriately, accidents may occur due to the falling unit.
- **If refrigerant gas has leaked during the installation work, ventilate the room immediately.**
  If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.
- **After the installation work, confirm that refrigerant gas does not leak.**
  If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas might generate.
- **Electrical work must be performed by a qualified electrician in accordance with the Installation Manual. Make sure the air conditioner uses an exclusive power supply.**
  An insufficient power supply capacity or inappropriate installation may cause fire.
- **Use the specified wires for wiring connect the terminals securely fix. To prevent external forces applied to the terminals from affecting the terminals.**
- **Conform to the regulations of the local electric company when wiring the power supply.**
  Inappropriate grounding may cause electric shock.
- **Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.**
  If a combustible gas leaks, and stays around the unit, a fire may occur.

2 INSTALLATION OF NEW REFRIGERANT AIR CONDITIONER

This air conditioner adopts the new HFC refrigerant (R410A) which does not deplete the ozone layer.

- R410A refrigerant is apt to be affected by impurity such as water, oxidizing membrane, or oils because the pressure of R410A refrigerant is higher than that of the former refrigerant by approx. 1.6 times. Accompanied with adoption of the new refrigerant, refrigerating oil has been also changed. Therefore pay attention so that water, dust, former refrigerant, or refrigerating oil does not enter into the refrigerating cycle of the new refrigerant air conditioner during installation work.
- To prevent from mixing of refrigerant or refrigerating oil, the size of charge port of the main unit or connecting section of installation tool differs from that of the air conditioner for the former refrigerant. Accordingly the exclusive tools are required for the new refrigerant (R410A) as shown below.
- For connecting pipes, use the new and clean piping materials so that water or dust does not enter.

Required tools and cautions on handling

It is necessary to prepare the tools and parts as described below for the installation work.

The tools and parts which will be newly prepared in the following items should be restricted to the exclusive use.

Explanation of symbols

● : Newly prepared (It is necessary to use it properly exclusive to R410A separated from those for R22 or R407C.)
○ : Former tool is available.

Used tools	Usage	Proper use of tools/parts
Gauge manifold	Vacuuming or charging of refrigerant and operation check	● Newly prepared, Exclusive to R410A
Charging hose		● Newly prepared, Exclusive to R410A
Charging cylinder	Charges refrigerant	Unusable (Use the Refrigerant charging balance.)
Gas leak detector	Checks gas leak	● Newly prepared
Vacuum pump	Vacuum drying	Usable if a counter-flow preventive adapter is attached
Vacuum pump with counter-flow preventive adapter	Vacuum drying	○ : R22 (Existing article)
Flare tool	Flare processing of pipes	○ : Usable by adjusting size
Bender	Bending processing of pipes	○ : R22 (Existing article)
Refrigerant recovery device	Recovers refrigerant	● Exclusive to R410A
Torque wrench	Tightens flare nut	● Ø12.7mm, Exclusive for Ø15.9mm
Pipe cutter	Cuts pipes	○ : R22 (Existing article)
Refrigerant cylinder	Charges refrigerant	● Exclusive to R410A ID : Refrigerant name entered
Welding machine/ Nitrogen gas cylinder	Welding of pipes	○ : R22 (Existing article)
Refrigerant charging balance	Charges refrigerant	○ : R22 (Existing article)

3 SELECTION OF INSTALLATION PLACE

⚠ WARNING

- **Install the air conditioner where there is sufficient strength to weight of the unit.**
  If strength is insufficient, the unit may fall down resulting in human injury.
- **Perform a specified installation work to guard against an earth quake.**
  An incomplete installation can cause accidents by the units failing and dropping.
- **Install the air conditioner at a height 2.5m or more from the floor.**
  If you insert your hands or others directly into the unit while the air conditioner operates, it is dangerous because you may contact with revolving fan or active electricity.

⚠ CAUTION

- **Do not install the air conditioner in a location subject to a risk of exposure to combustible gas.**
  Should the combustible gas leak and collect near the unit, fire may occur.

Upon approval of the customer, install the air conditioner in a place that satisfies the following conditions.

- Place where the unit can be installed horizontally.
- Place where a sufficient servicing space can be ensured for safe maintenance and check.
- Place where drained water will not cause any problem.

Avoid installing in the following places.

- Place exposed to air with high salt content (seaside area), or place exposed to large quantities of sulfide gas (hot spring). (Should the unit be used in these places, special protective measures are needed.)
- Place exposed to oil, vapor, oil smoke or corrosive gas.
- Place where organic solvent is used nearby.
- Place close to a machine generating high frequency.
- Place near door or window where may come to contact with the fresh air of high humidity. (Dewing may be caused.)
- Place where special spray is frequently used.
- Place with poor ventilation.

Installation under high-humidity atmosphere

In some cases including the rainy season, especially inside of the ceiling may become high-humidity atmosphere (dew-point temperature: 23°C or higher).

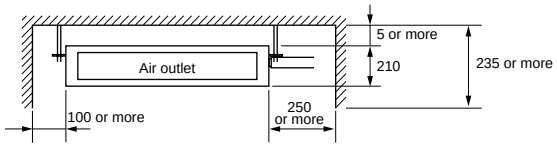
1. Installation to inside of the ceiling with tiles on the roof
2. Installation to inside of the ceiling with slated roof
3. Installation to a place where inside of the ceiling is used for pathway to intake the fresh air
   - In the above cases, additionally attach the heat insulator to all positions of the air conditioner, which come to contact with the high-humidity atmosphere. In this case, arrange the side plate (Check port) so that it is easily removed.
   - Apply also a sufficient heat insulation to the duct and connecting part of the duct.

[Reference] Dewing test conditions
Indoor side: 27°C dry bulb temperature
24°C wet bulb temperature
Air volume: Low air volume, operation time 4 hours

3 SELECTION OF INSTALLATION PLACE

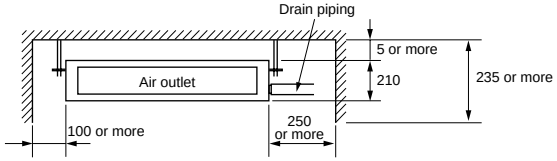
Installation space

MMD-AP0071SPH-C, AP0091SPH-C, AP0121SPH-C, AP0151SPH-C, AP0181SPH-C

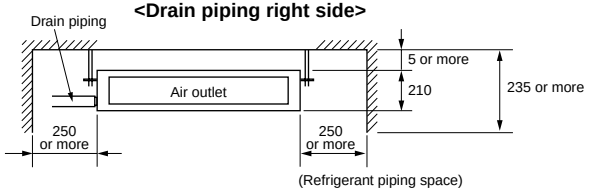


MMD-AP0071SH-C, AP0091SH-C, AP0121SH-C, AP0151SH-C, AP0181SH-C

<Drain piping left side>



<Drain piping right side>



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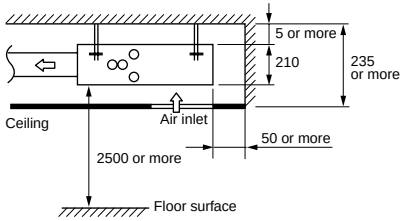
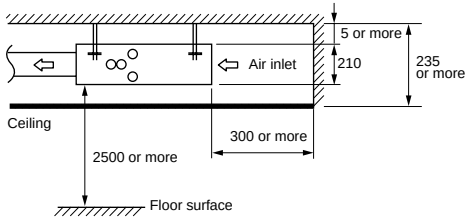
MMD-AP0071SH-C, AP0091SH-C, AP0121SH-C, AP0151SH-C, AP0181SH-C

<Under air inlet>

(Refrigerant piping space)



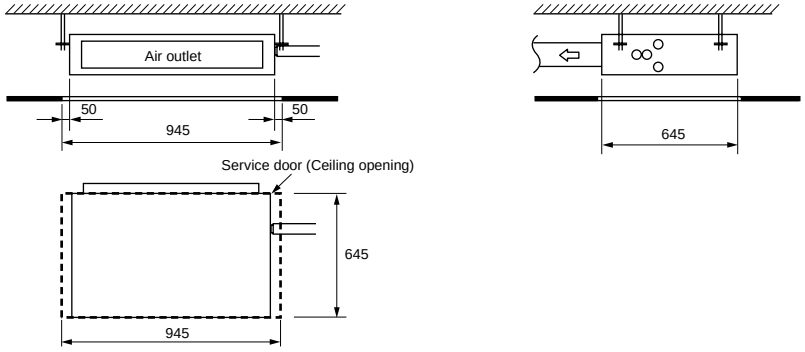
<Back air inlet>



Unit (mm)

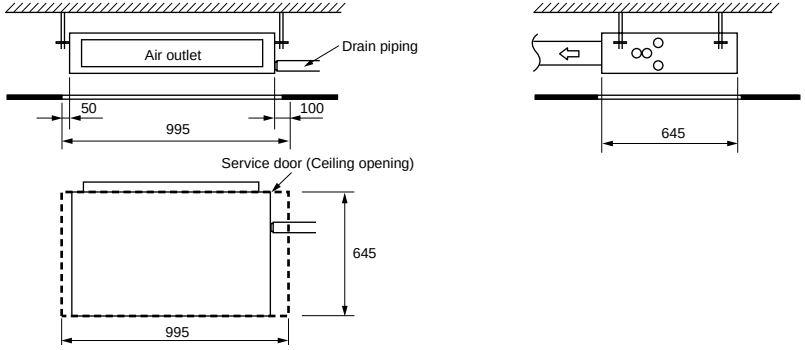
Service space

MMD-AP0071SPH-C, AP0091SPH-C, AP0121SPH-C, AP0151SPH-C, AP0181SPH-C

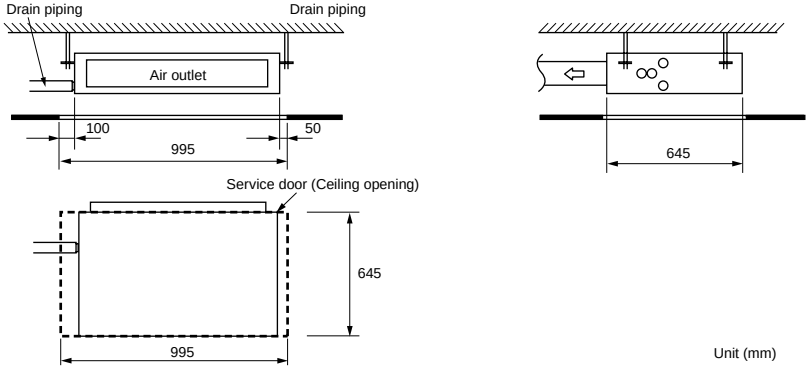


MMD-AP0071SH-C, AP0091SH-C, AP0121SH-C, AP0151SH-C, AP0181SH-C

<Drain piping left side>



<Drain piping right side>



Unit (mm)

Notification of filter cleaning term setup

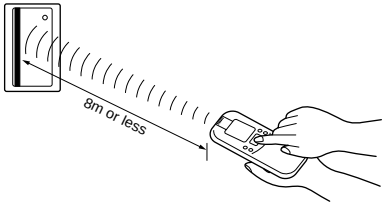
The lighting term setup of the filter sign (Notification of filter cleaning) of the remote controller can be changed according to the condition of installation. If the room is not heated due to the installation place or construction of the room, the detection temperature of heating can be raised.

For setup method, refer to “Change of lighting term of filter sign” and “To secure better effect of heating” in the Applicable controls of this Manual.

In case of wireless type

The sensor of indoor unit with wireless remote controller can receive a signal 8m or less.
Based upon it, determine a place where the remote controller is operated and the installation place of the indoor unit.

- To prevent a malfunction, select a place where is not influenced by a florescent light or direct sunlight.
- Two or more (Up to 6 units) indoor units with wireless remote controller can be installed in the same room.



4 INSTALLATION OF INDOOR UNIT

WARNING

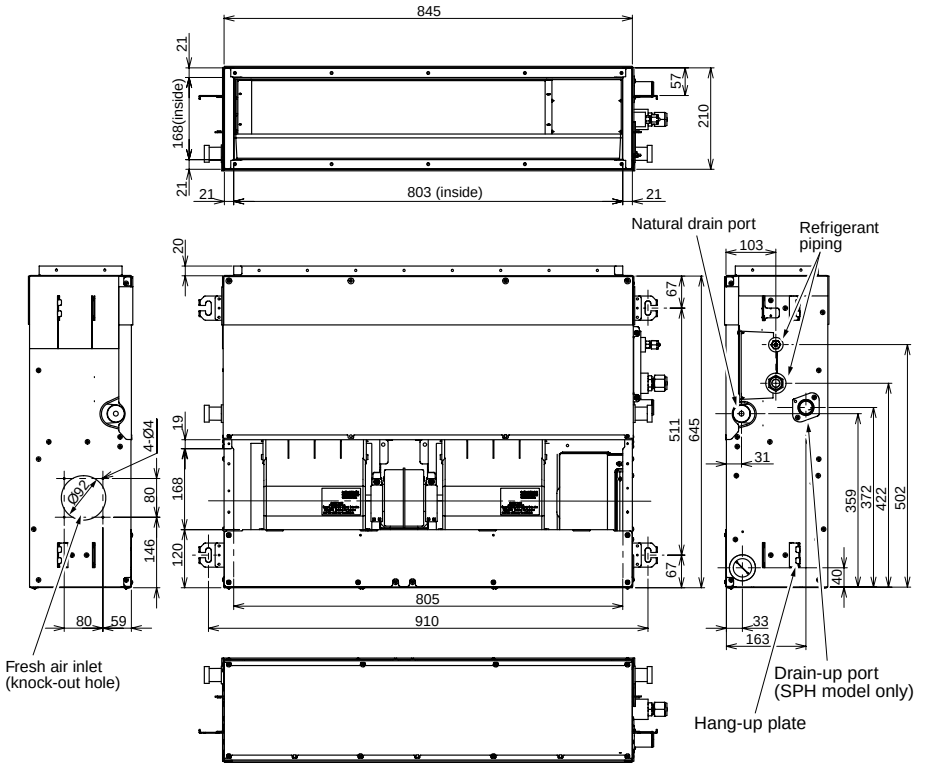
Install the air conditioner certainly to sufficiently withstand the weight.
If the strength is insufficient, the unit may fall down resulting in human injury.
Perform a specified installation work to guard against strong wind or earthquake.
An incomplete installation can cause accidents by the units falling and dropping.

REQUIREMENT

Strictly comply with the following rules to prevent damage of the indoor units and human injury.

- Do not put a heavy article on the indoor unit. (Even units are packaged)
- Carry in the indoor unit as it is packaged if possible. If carrying in the indoor unit unpacked by necessity, be sure to use buffering cloth, etc. to not damage the unit.
- To move the indoor unit, hold the hooking metals (4 positions) only.
  Do not apply force to the other parts (refrigerant pipe, drain pan, foamed parts, or resin parts, etc.).
- Carry the package by two or more persons, and do not bundle it with PP band at positions other than specified.

External view



4 INSTALLATION OF INDOOR UNIT

Opening hole on ceiling and placing of hanging bolt

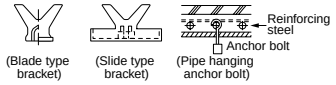
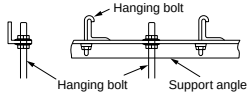
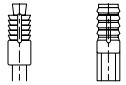
- Considering the indoor unit and the hanged-up piping/wiring work, determine the installation position and direction.
- After installation position of the indoor unit has been determined, open a hole on the wiring and place the hanging bolt.
- For opening size of the ceiling and the hanging bolt pitch, see the external view.
- When the ceiling has already boarded, draw the drain pipe, refrigerant pipe, inter-unit wire between indoor and outdoor units, central control system wire, and remote controller wire up to the position where pipes and wires are connected before hanged-up the indoor unit.

The hanging bolts and nuts will be procured locally.

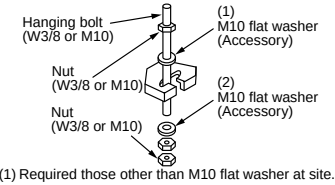
Hanging bolt	M10 or W3/8	4 pieces
Nut	M10 or W3/8	12 pieces

Installation of indoor unit

Use M10 hanging bolts (4 pcs, to be local procure).
Matching to the existing structure, set pitch according to size in the unit external view as shown below.

New concrete slab	Steel flame structure	Existing concrete slab
Install the bolts with insert brackets or anchor bolts.	Use existing angles or install new support angles.	Use a hole-in anchors, hole-in plugs, or a hole-in bolts.
		

- Attach the nuts (M10 or W3/8: Procured locally) and the attached washers (Ø34) to the hanging bolt.
- Put washers at up and down of T-groove of the hanging bracket of the indoor unit to hang down the indoor unit.
- Using a level vial, check that four sides are horizontal. (Horizontal degree: Within 5mm)



(1) Required those other than M10 flat washer at site.
(2) To prevent falling-off of bolt (safety), be sure to set it just under the hanging bracket as shown in the figure.

5 DRAIN PIPING WORK

⚠ CAUTION

- In these models of the air conditioner, two types of models, the models (-APXXXX**SPH** series) attached with drain-up pump and the natural draining models (-APXXXX**SH** series) are included.
  Perform the construction work according to each draining method.
- Following the Installation Manual, perform the drain piping work so that water is properly drained, and apply a heat insulation so as not to cause a dew. Inappropriate piping work may result in water leakage in the room and wet of furniture.

5-1. In case of drain up pump model (MMD-AP0071SPH-C to AP0181SPH-C)

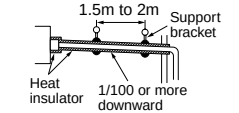
5-1-1. Pipe material/Insulator and size

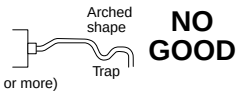
The following materials for piping work and insulating process are procured locally.

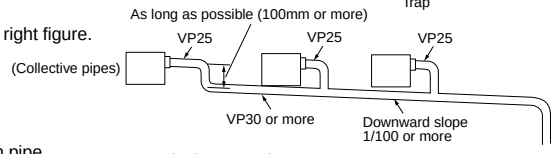
Pipe material	Hard vinyl chloride pipe socket for VP25
	Hard vinyl chloride pipe VP25 (Nominal diameter Ø32mm)
Insulator	Foamed polyethylene foam, thickness: 10mm or more

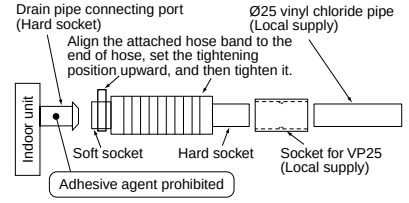
REQUIREMENT

- Be sure to perform heat insulation of the drain pipes of the indoor unit.
- Never forget to perform heat insulation of the connecting part with the indoor unit. An incomplete heat insulation causes dewing.
- Set the drain pipe with downward slope (1/100 or more), and do not make swelling or trap on the piping. It may cause an abnormal sound.
- For length of the traversing drain pipe, restrict to 20m or less. In case of a long pipe, provide support brackets with interval of 1.5 to 2m in order to prevent waving.
- Set the collective piping as shown in the right figure.
- Do not mount an air purge pipe, otherwise drain water spouts out resulted in water leak.
- The hard vinyl-chloride pipe cannot be directly connected to the drain pipe connecting port of the indoor unit.
  For connection with the drain pipe connecting port, be sure to fix the attached flexible hose.
- Adhesive agent cannot be used for the pipe connecting port (hard socket) of the indoor unit. Be sure to use the attached hose band for fixing, otherwise damage or water leakage of the drain pipe connecting port is caused.







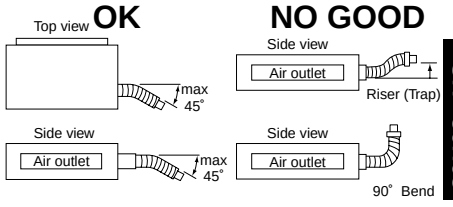

Drain pipe connecting port (Hard socket)
Ø25 vinyl chloride pipe (Local supply)
Align the attached hose band to the end of hose, set the tightening position upward, and then tighten it.
Indoor unit
Soft socket
Hard socket
Socket for VP25 (Local supply)
Adhesive agent prohibited

5-1-2. Connection of flexible hose

- Insert the soft socket of the attached flexible hose into the connecting port of the drain pipe until it strikes against the end.
- Align the attached hose band to the end of the pipe connecting port, and then tighten it surely.

REQUIREMENT

- **Be sure to fix the soft socket with the attached hose band and set the tightening position at upper side.**
- **Use the attached flexible hose by bending it with 45° or less so that no breakage or clogging occurs.**



5 DRAIN PIPING WORK

5-1-3. Connection of drain pipe

- Connect the hard socket (local supply) to the hard socket side of the attached flexible hose which has been installed.
- Connect the drain pipes (local supply) successively to the connected the hard socket.

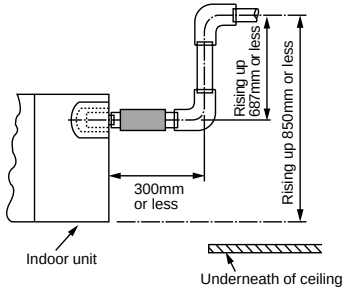
REQUIREMENT

- Using adhesive agent for vinyl chloride, connect the hard vinyl chloride pipes certainly so that water does not leak.
- It requires several times to dry and harden the adhesive agent.
  (Refer to Guide Manual of the adhesive agent.)
  In this time, be sure not to apply force to the connecting section with the drain pipes.

5-1-4. Drain up

When a downward grading cannot be secured on the drain pipe, a drain-up work is possible.

- Set the height of the drain pipe within 850mm from the bottom surface of the indoor unit.
- Draw out the drain pipe within 300mm from the end of the drain pipe connecting port of the indoor unit, and then raise it vertically.
- After the drain pipe has been raised, set a grading so that it is immediately bent downward.



5-1-5. Check the draining

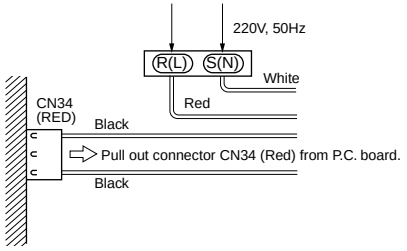
After drain piping work, check that water drain is properly performed and water does not leak from the connecting part of the pipes. In this time, check also there is no abnormal sound of the motor of the drain pump. Be sure to check draining when installed in the heating period.

When the electric work has finished:

- Pour water as shown in the following figure, check water is drained from the drain pipe connecting port in COOL mode, and then check there is no water leak from the drain pipes.

When the electric work has not finished:

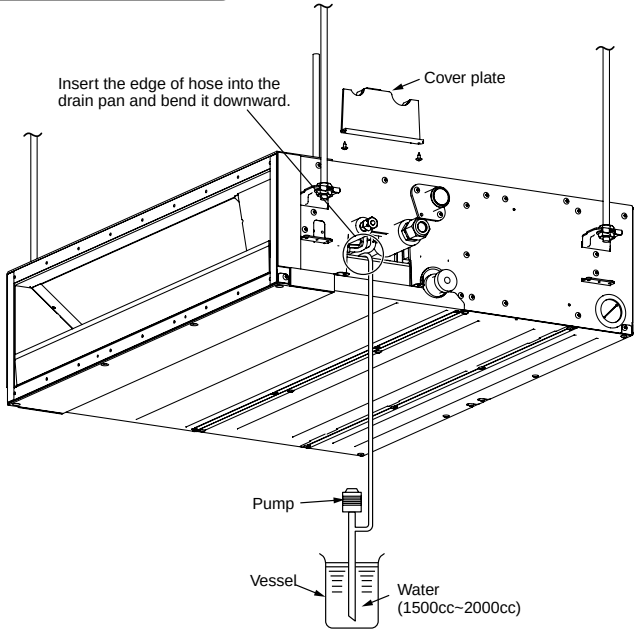
- Pull out the float switch connector (3P: Red) from P.C. board connector (CN34: Red) of the electric parts box. (In this time, be sure to check the power is turned off.)
- Connect the single-phase 220V, 50Hz power to the terminal blocks R (L) and S (N).
  (Never apply 220V to (A), (B), (U1),and (U2), otherwise a trouble of P.C. board occurs.)
- Pour water referring to the figure.
  (Amount: 1500cc to 2000cc)
- When the power is turned on, the drain pump motor drives automatically. Check water is drained from the drain pipe connecting port, and then check there is no water leak from the drain pipes.
- After check of drainage and water leak, turn off the power supply, attach the float switch connector to the original position (CN34) of P.C. board, and then set the electric parts box as before.



⚠ CAUTION

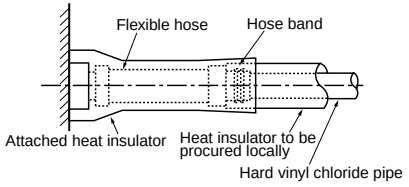
Pour water slowly.

If it is poured urgently, water is spread inside of the indoor unit resulted in a trouble.



Heat insulating process

- After drain check, using the attached heat insulator for drain connecting section, wrap the flexible hose without clearance from the end of the drain pipe connecting port of the indoor unit.
- Covering the attached heat insulator for drain connecting section, wrap the drain pipe with heat insulator (local supply) without clearance.



5 DRAIN PIPING WORK

5-2. In case of drain up pump less model (MMD-AP0071SH-C to AP0181SH-C)

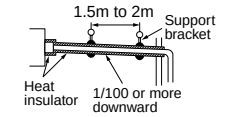
5-2-1. Pipe material/Insulator and size

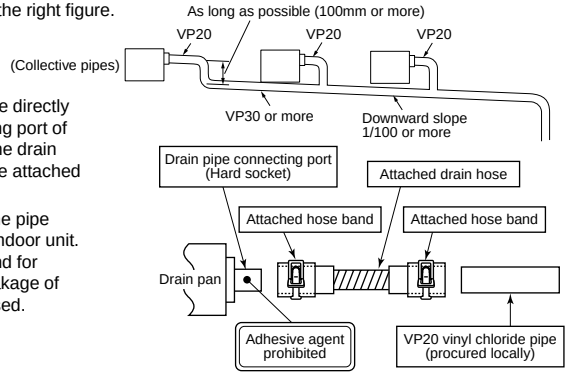
The following materials for piping work and insulating process are procured locally.

Pipe material	Hard vinyl chloride pipe socket for VP20
	Hard vinyl chloride pipe VP20 (Nominal outer diameter Ø26mm)
Insulator	Foamed polyethylene foam, thickness: 10mm or more

REQUIREMENT

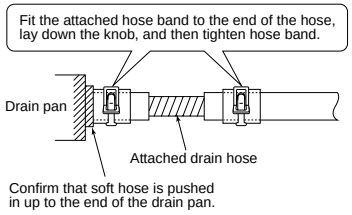
- Be sure to perform heat insulation of the drain pipes of the indoor unit.
- Never forget to perform heat insulation of the connecting part with the indoor unit. An incomplete heat insulation causes dewing.
- Set the drain pipe with downward slope (1/100 or more), and do not make swelling or trap on the piping. It may cause an abnormal sound.
- For length of the traversing drain pipe, restrict to 20m or less. In case of a long pipe, provide support brackets with interval of 1.5 to 2m in order to prevent waving.
- Set the collective piping as shown in the right figure.
- Do not mount an air purge pipe, otherwise drain water spouts out resulted in water leak.
- The hard vinyl-chloride pipe cannot be directly connected to the drain pipe connecting port of the indoor unit. For connection with the drain pipe connecting port, be sure to fix the attached flexible hose.
- Adhesive agent cannot be used for the pipe connecting port (hard socket) of the indoor unit. Be sure to use the attached hose band for fixing, otherwise damage or water leakage of the drain pipe connecting port is caused.





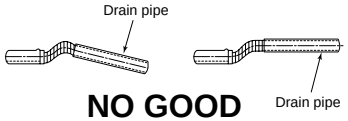
5-2-2. Connection of drain hose

- Insert the attached drain hose into the drain pipe connecting port on the drain pan up to the end.
- Fit the attached hose band to the end of the pipe connecting port, and then tighten it securely.


Fit the attached hose band to the end of the hose, lay down the knob, and then tighten hose band.
Drain pan
Attached drain hose
Confirm that soft hose is pushed in up to the end of the drain pan.

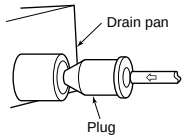
REQUIREMENT

- Be sure to fix the drain hose with the attached hose band, and set the tightening position upward.
- As the draining is the natural water draining, arrange the pipe outside of the unit on the down slope.
- If piping is performed as shown in the figure, drain cannot be discharged.



5-2-3. Connection of drain pipe

- Connect the hard vinyl chloride pipe (procured locally) to the mounted drain hose which was attached.
- **In case of taking pipe from the left side**
  - In case of connect the drain pipe from the left side, take-out the plug from left. Push in the plug of which end is not sharp up to the end.
- **In case of taking pipe from the right side**
  - In case of connect the drain pipe from the right side, take-out the plug from right. Push in the plug of which end is not sharp up to the end.



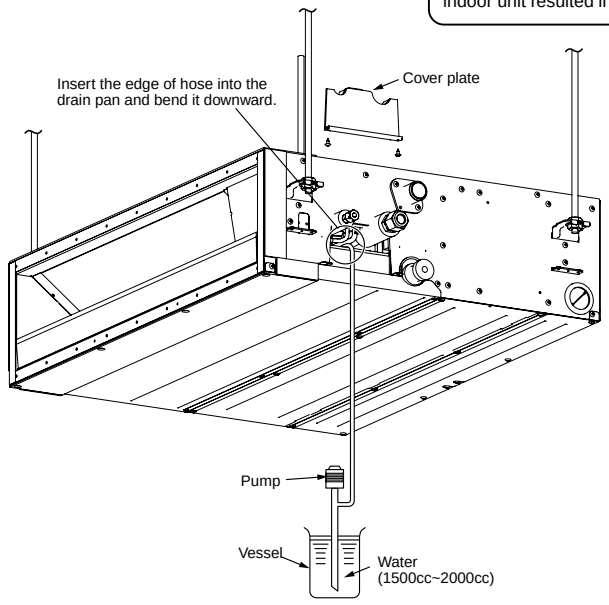
5-2-4. Check the draining

After drain piping work, check that water drain is properly performed and water does not leak from the connecting part of the pipes.

⚠ CAUTION

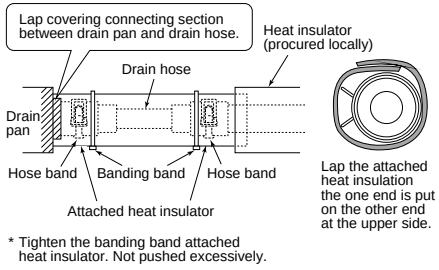
Pour water slowly.

If it is poured urgently, water is spread inside of the indoor unit resulted in a trouble.



Heat insulating process

- Using the attached drain hose heat insulator, lap the connecting section and the drain hose without clearance, and then tighten with two banding band.
- Covering the attached drain hose heat insulator, lap the heat insulator (procured locally) to the drain pipe without clearance.


Lap covering connecting section between drain pan and drain hose.
Heat insulator (procured locally)
Drain hose
Drain pan
Hose band
Banding band
Hose band
Attached heat insulator
Lap the attached heat insulation the one end is put on the other end at the upper side.

* Tighten the banding band attached heat insulator. Not pushed excessively.

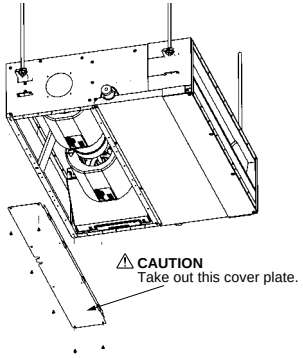
6 AIR DUCTING

6-1. Arranging the Duct connection port

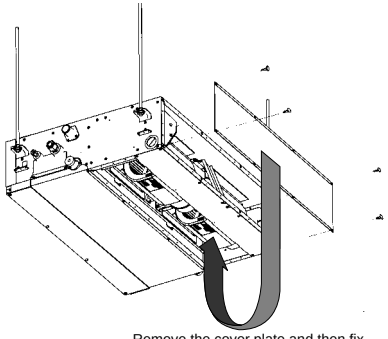
Referring to the following dimensions, manufacture duct at the local site.

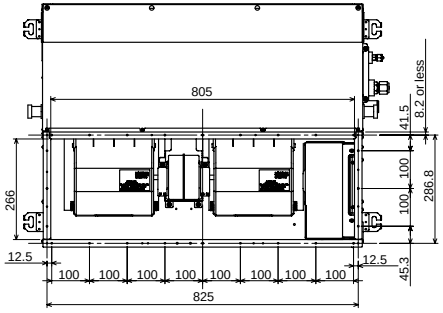
Be sure to mount an air filter to the air inlet side at the local site; otherwise decrease of capacity and etc. may be caused.

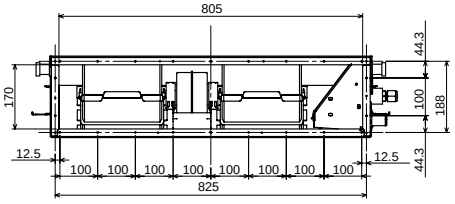
<Under air inlet>



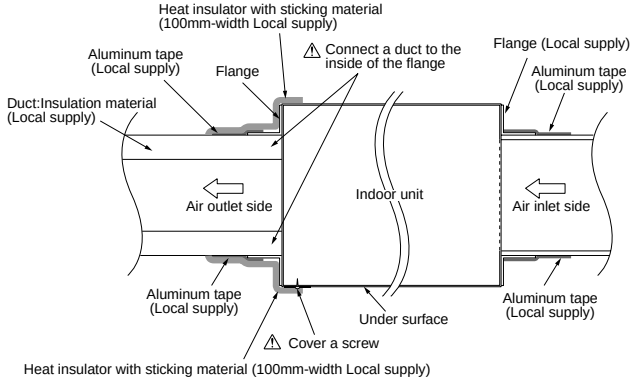
<Back air inlet>







6-2. Connecting method of the duct


Heat insulator with sticking material (100mm-width Local supply)
Aluminum tape (Local supply)
Flange
⚠ Connect a duct to the inside of the flange
Flange (Local supply)
Aluminum tape (Local supply)
Duct:Insulation material (Local supply)
Air outlet side
Indoor unit
Air inlet side
Aluminum tape (Local supply)
Under surface
Aluminum tape (Local supply)
⚠ Cover a screw
Heat insulator with sticking material (100mm-width Local supply)

⚠ CAUTION

Incomplete heat insulation of the supply air flange and sealing may occur dewing resulted in falling of water drop.

7 REFRIGERANT PIPING

⚠ WARNING

- **If refrigerant gas has leaked during the installation work, ventilate the room immediately.**
- If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.
- **After the installation work, confirm that refrigerant gas does not leak.**
- If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas may generate.

REQUIREMENT

When the refrigerant pipe is long, set the support brackets to fix the pipe with 2.5 to 3m intervals. If the pipe is not fixed, abnormal sound may generate.

Be sure to use the flare nuts attached to the indoor unit or those fro R410A.

Permissible pipe length and permissible height difference

They are different according to the used outdoor unit. For details, refer to the Installation Manual attached to the outdoor unit.

Piping material and dimensions

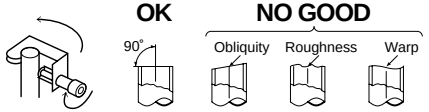
Piping material		Phosphor deoxidization joint-less pipe for air conditioner	
Model MMD-		AP007 to AP012	AP015 to AP018
Pipe size (mm)	Gas side	Ø9.5	Ø12.7
	Liquid side	Ø6.4	Ø6.4

- Use a clean and new pipe, and check that impurity such as dust, oil, moisture, etc. does not adhere in the pipe.

Pipe forming/End positioning

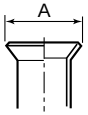
Flaring

1. Cut the pipe with a pipe cutter.



2. Insert a flare nut into the pipe, and flare the pipe.
   As the flaring sizes of R410A differ from those of refrigerant R22, the flare tools newly manufactured for R410A are recommended.
   However, the conventional tools can be used by adjusting projection margin of the copper pipe.

- **Flaring diam. meter size : A (Unit : mm)**

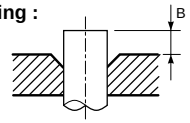


Outer diam. of copper pipe	$A^{+0}_{-0.4}$
	R410A
6.4	9.1
9.5	13.2
12.7	16.6

* In case of flaring for R410A with the conventional flare tool, pull it out approx. 0.5 mm more than that for R22 to adjust to the specified flare size.
  The copper pipe gauge is useful for adjusting projection margin size.

7 REFRIGERANT PIPING

- **Projection margin in flaring : B (Unit : mm)**



Rigid (Clutch type)

Outer diam. of copper pipe	R410A tool used		Conventional tool used	
	R410A	R22	R410A	R22
6.4	0 to 0.5	(Same as left)	1.0 to 1.5	0.5 to 1.0
9.5	0 to 0.5	(Same as left)	1.0 to 1.5	0.5 to 1.0
12.7	0 to 0.5	(Same as left)	1.0 to 1.5	0.5 to 1.0

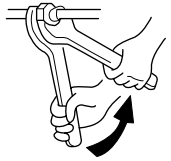
Imperial (Wing nut type)

Outer diam. of copper pipe	R410A	R22
6.4	1.5 to 2.0	1.0 to 1.5
9.5	1.5 to 2.0	1.0 to 1.5
12.7	2.0 to 2.5	1.5 to 2.0

Connection of refrigerant pipe

Connect all the refrigerant pipes with flare connecting work.

- Since the atmospheric pressure only is sealed as the sealing gas, it is not abnormal that "Pushu…" sound is not heard when the flare nut is removed.
- Be sure to use a double spanner for pipe connecting work of the indoor unit.



Work using double spanner

- Refer to the following table for tightening torque.

Connecting pipe outer dia. (mm)	Tightening torque (N•m)	Re-tightening torque (N•m)
Ø6.4	14 to18 (1.4 to 1.8 kgf•m)	18 (1.8 kgf•m)
Ø9.5	33 to 42 (3.3 to 4.2 kgf•m)	42 (4.2 kgf•m)
Ø12.7	50 to 62 (5.0 to 6.2 kgf•m)	62 (6.2 kgf•m)

- **Tightening torque of flare pipe connections**

Pressure of R410A is higher than that of R22 by approx. 1.6 times. Therefore, using a torque wrench, tighten the flare pipe connecting sections which connect the indoor and outdoor units of the specified tightening torque. Incorrect connections may cause not only a gas leak, but also a trouble of the refrigerating cycle.

REQUIREMENT

If an excessive torque is applied, the nut may crack depending on the installation conditions.

Airtight test/Air purge, etc.

For airtight test, air purge, addition of refrigerant, and gas leak check, follow the Installation Manual attached to the outdoor unit.

REQUIREMENT

Be sure to use the tool such as charge hose exclusive to R410A.

Do not turn on the power until the airtight test and the vacuuming have finished. (If turning on the power, the incorporated PMV is closed fully and the period until the vacuuming finishes elongates.

Open fully valves of the outdoor unit

Gas leak check

Check with a leak detector or soap water whether gas leaks or not, from the pipe connecting section or cap of the valve.

REQUIREMENT

Use a leak detector manufactured exclusively for HFC refrigerant (R410A, R134a, etc.).

8 ELECTRIC WORK

⚠ WARNING

1. **Using the specified wires, ensure to connect the wires, and fix wires securely so that the external strength of the wires do not transmit to the connecting part of the terminals.**
   Incomplete connection or fixation may cause a fire, etc.
2. **Be sure to connect earth wire. (Grounding work)**
   Do not connect the earth wire to gas pipe, city water pipe, lightning rod, or the earth wire of telephone. Incomplete grounding causes an electric shock.
3. **For electric work, strictly follow to the Local Regulation in each country and the Installation Manual, and use an exclusive circuit.**
   Capacity shortage of power circuit or incomplete installation may cause an electric shock or a fire.

⚠ CAUTION

Be sure to install an earth leakage breaker.
If an earth leakage breaker is not installed, an electric shock may be caused.

REQUIREMENT

- For power supply wiring, strictly conform to the Local Regulation in each country.
- For wiring of power supply of the outdoor units, follow to the Installation Manual of each outdoor unit.
- Never connect 220V power to the terminal blocks (A, B, U1, U2, X, Y, etc.) for control wiring. (Otherwise, the system will be failed.)
- Perform the electric wiring so that it does not come to contact with the high-temperature part of the pipe. The coating may melt resulted in an accident.
- After connecting wires to the terminal blocks, provide a trap and fix wires with the wire clamp.
- Store the refrigerant piping line and control wiring line in the same line.
- Do not turn on the power of the indoor unit until vacuuming of the refrigerant pipes completes.

8 ELECTRIC WORK

Power supply cord and communication wires specifications

Power supply cord and communication wires are procured locally.

For the power supply specifications, follow to the table below. If capacity is little, it is dangerous because overheat or seizure may be caused.

For specifications of the power capacity of the outdoor unit and the power supply wires, refer to the Installation Manual attached to the outdoor unit.

Indoor unit power supply

- For the power supply of the indoor unit, prepare the exclusive power supply separated from that of the outdoor unit.
- Arrange the power supply, earth leakage breaker, and main switch of the indoor unit connected to the same outdoor unit so that they are commonly used.
- Power supply cord specification : Cable 3-core 2.5mm², **in conformity with Design 60245 IEC 57**.

Power supply	Power supply		220V, 50Hz
	Power supply switch/Earth leakage breaker or power supply wiring/fuse rating for indoor units should be selected by the accummulated total current values of the indoor units.		
	Power supply wiring	Below 20m	Twist wire : 2.0 mm²
		Below 50m	Twist wire : 3.5 mm²

Control wiring, Central controller wiring

- 2-core with polarity wires are used for the Control wiring between indoor unit and outdoor unit and Central controller wiring.
- To prevent noise trouble, use 2-core shield wire.
- The length of the communication line means the total length of the inter-unit wire length between indoor and outdoor units added with the central control system wire length.

Communication line	Control wiring between indoor unit and outdoor unit (2-core shield wire)	Wire size	(Up to 1000m) Twist wire : 1.25 mm² (Up to 2000m) Twist wire : 2.0 mm²
	Central control line wiring (2-core shield wire)	Wire size	(Up to 1000m) Twist wire : 1.25 mm² (Up to 2000m) Twist wire : 2.0 mm²

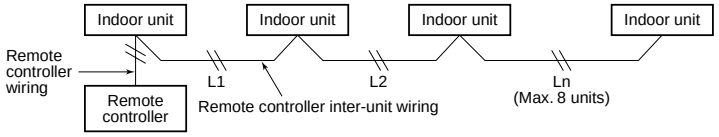
Remote controller wiring

- 2-core with non-polarity wire is used for wiring of the remote controller wiring and group remote controllers wiring.

Remote controller wiring, remote controller inter-unit wiring	Twist wire: 0.5mm² to 2.0mm² × 2	
Total wire length of remote controller wiring and remote controller inter-unit wiring = L + L1 + L2 + … Ln	In case of wired type only	Up to 500m
	In case of wireless type included	Up to 400m
Total wire length of remote controller inter-unit wiring = L1 + L2 + … Ln		Up to 200m

CAUTION

The remote controller wire (Communication line) and AC220V wires cannot be parallel to contact each other and cannot be stored in the same conduits. If doing so, a trouble may be caused on the control system due to noise, etc.

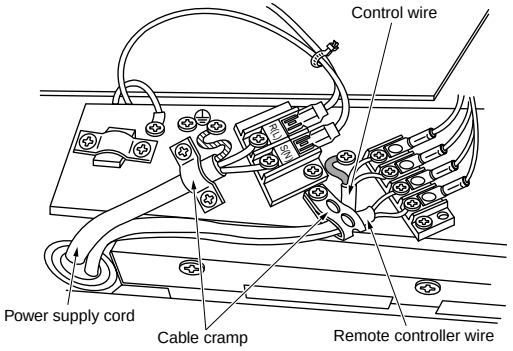


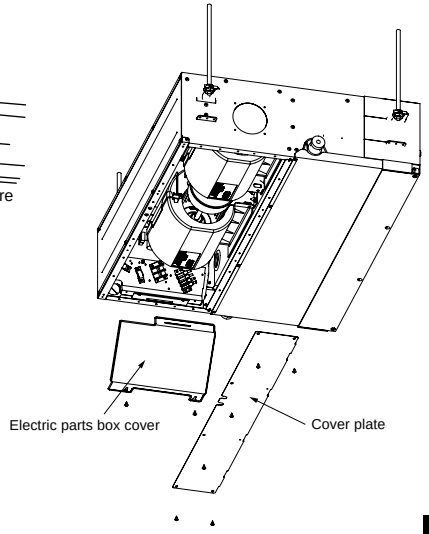
Cable connection

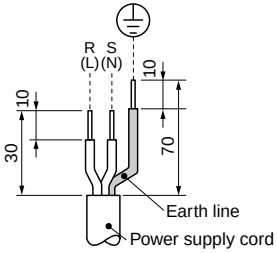
REQUIREMENT

- Be sure to pass the wire through the wire connection port of the indoor unit.
- Keep a margin (Approx. 100mm) on a wire to hang down the electric parts box at servicing, etc.
- The low-voltage circuit is provided for the remote controller.

- Before remove the electric parts cover, remove the cover plate.
- Remove the cover of the electric parts box by taking off the mounting screws (2 positions) and pushing the hooking section. (The cover of the electric parts box remains hanged to the hinge.)
- Tighten the screws of the terminal block, and fix the wires with cord clamp attached to the electric parts box. (Do not apply tension to the connecting section of the terminal block.)
- Be sure to set a loop for the connecting wire of the storing part of the indoor unit electric parts; otherwise the electric parts box cannot be drawn out in service time.
- Mount the cover of the electric parts box without pinching wires.





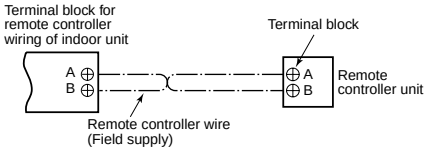


8 ELECTRIC WORK

Remote controller wiring

- As the remote controller wire has no polarity, there is no problem if connections to indoor unit terminal blocks A and B are reversed.

<Wiring diagram>

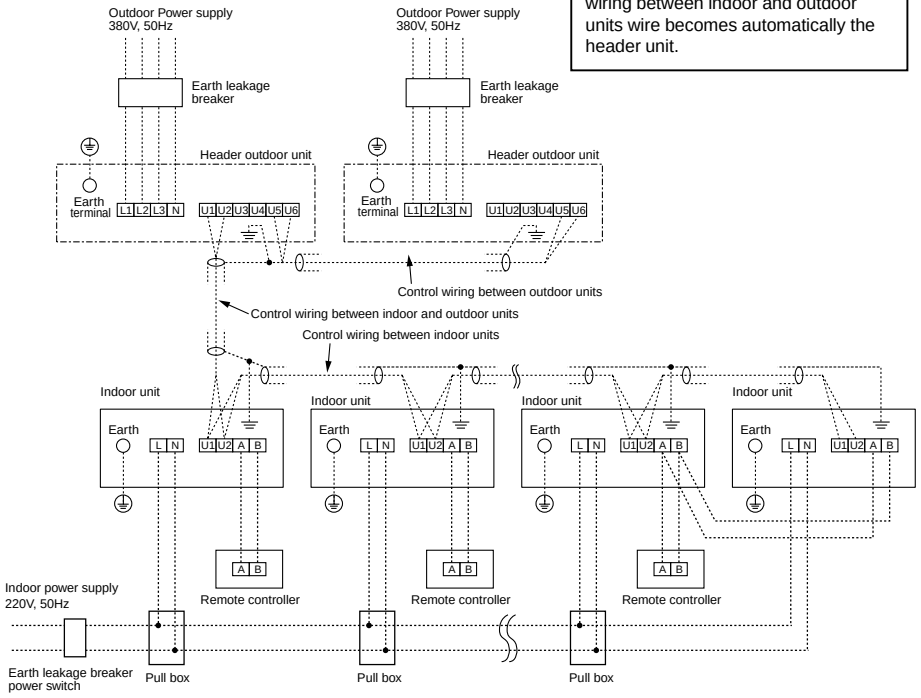


Wiring between indoor and outdoor units

<Wiring example>

NOTE

An outdoor unit connected with control wiring between indoor and outdoor units wire becomes automatically the header unit.



Address setup

Set up the addresses according to the Installation Manual attached to the outdoor unit.

9 APPLICABLE CONTROLS

NOTIFICATION

When using the equipment at the first time, it will take a lot of time that the remote controller accepts an operation after power was on. However, it is not a trouble.

- **Automatic address**
  - While automatic addressing, the operation cannot be performed on the remote controller.
  - For automatic addressing, Max. 10 minutes (generally, approx. 5 minutes) are required.
- **When power will be turned on after finish of automatic addressing;**
  - It will require Max. 10 minutes (generally, approx. 3 minutes) that outdoor unit starts operation after power was on.

As all have been set to [Standard] at the shipment, change the setup of the indoor unit if necessary.

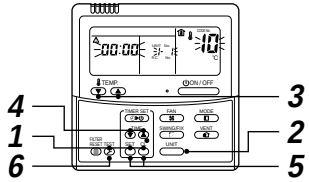
To change the setup, use the main remote controller (wired remote controller).

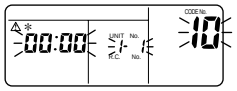
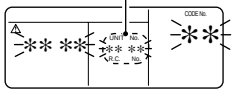
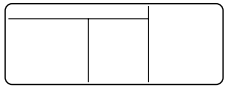
* The setup change for wireless remote controller, sub remote controller, or remote controller-less system (Central control remote controller only is provided.) is impossible. In these cases, prepare and mount a separate main remote controller.

Exchange of applicable control setup

Basic operation procedure for setup exchange

Change the setup while operation of the equipment stops.
(Be sure to stop the operation of a set.)



Procedure	Description
1	When pushing SET, CL, and TEST buttons simultaneously for 4 seconds or more, after a while, the display part flashes as shown in the figure. Check that the displayed item code is [10]. • If the item code indicates other than [10], push TEST button to erase the display, and then retry the operation from the first step. (For some time after TEST button has been pushed, the operation of the remote controller cannot be accepted.) (In a group control, the firstly displayed indoor unit No. becomes the header unit.)  (* The display changes according to the indoor unit model.)
2	Every pushing UNIT button, the indoor unit No. in the group control is displayed successively. Select an indoor unit of which setup to be changed. In this time, the position of the indoor unit of which setup to be changed can be confirmed because the fan and the flap of the selected indoor unit work.
3	Using ▼, ▲ buttons of set temperature, specify the item code [**].
4	Using ▼, ▲ buttons of timer time, select set data [****]. 
5	Push SET button. In this time, if the display changes from flashing to lighting, the setup completes. • To change the setup of an indoor unit other than the selected one, start operation from Procedure ***2***. • To change the setup of another setup in the selected indoor unit, start operation from Procedure ***3***. Pushing CL button clears the set up contents which have been already set. In this case, retry from Procedure ***2***.
6	When the setup finished, push TEST button. (The setup is determined.) Pushing TEST button deletes the display and returns the status to normal stop status. (For some time after TEST button has been pushed, the operation of the remote controller cannot be accepted.) 

9 APPLICABLE CONTROLS

Setup of external static pressure

Be sure to set up a tap change based upon the resistance (external static pressure) of the duct to be connected.

To set up a tap change, follow to the basic operation procedure (**1** → **2** → **3** → **4** → **5** → **6**).

- Specify [5d] to the item code in procedure **3**.
- For the setup data of procedure **4**, select a setup data of the external static pressure to be set up from the following table.

<Change on wired remote controller>

Setup data	External static pressure	
0000	10 Pa	Standard (At shipment)
0001	20 Pa	High static pressure 1
0003	35 Pa	High static pressure 2
0006	50 Pa	High static pressure 3

In case of remote controller-less (Group control)

For setup to the high ceiling or change of the air filter specifications:

There is selecting method by exchanging the short plugs on the indoor microcomputer P.C. board as shown in the following table other than selecting method by standard wired remote controller (sold separately).

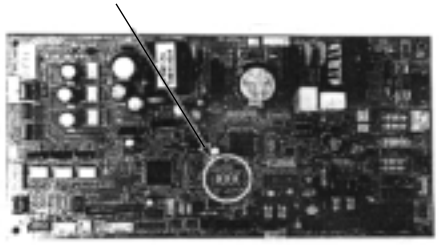
Utilize this method for remote controller-less (Group control) case.

∗ However, when the setup to high ceiling has been once exchanged, it is required for returning it to 0000 to change the short plug to the standard (at shipment) position and rewrite data to the setup data 0000 from the wired remote controller sold separately though setup to 0001, 0003 or 0006 are freely available.

- **Select by exchange of short plugs on the indoor P.C. board.**

Short plug position (Short / Open)	Set data	External static pressure
CN112 CN111 CN110	**0000**	10 Pa (At shipment)
CN112 CN111 CN110	**0001**	20 Pa
CN112 CN111 CN110	**0003**	35 Pa
CN112 CN111 CN110	**0006**	50Pa

- **Short plug position (CN112, CN111, CN110 from the left)**



Change of lighting term of filter sign

According to the installation condition, the lighting term of the filter sign (Notification of filter cleaning) can be changed.

Follow to the basic operation procedure (**1** → **2** → **3** → **4** → **5** → **6**).

- For the item code in Procedure **3**, specify [01].
- For the [Set data] in Procedure **4**, select the setup data of filter sign lighting terme from the following table.

Setup data	Filter sign lighting term
0000	None
0001	150H
0002	2500H (At shipment from factory)
0003	5000H
0004	10000H

To secure better effect of heating

When it is difficult to obtain satisfactory heating due to installation place of the indoor unit or structure of the room, the detection temperature of heating can be raised. Also use a circulator, etc. to circulate heat air near the ceiling.

Follow to the basic operation procedure (**1** → **2** → **3** → **4** → **5** → **6**).

- For the item code in Procedure **3**, specify [06].
- For the set data in Procedure **4**, select the setup data of shift value of detection temperature to be set up from the table below.

Setup data	Detection temp shift value
0000	No shift
0001	+1°C
0002	+2°C (At shipment from factory)
0003	+3°C
0004	+4°C
0005	+5°C
0006	+6°C

Group control

In a group control, a remote controller can control up to maximum 8 units.

- For cabling procedure and cables of the individual line (Identical refrigerant line) system, refer to “Electric work” in this Manual.
- Cabling between indoor units in a group is performed in the following procedure.

  Connect the indoor units by connecting the remote controller inter-unit cables from the remote controller terminal blocks (A, B) of the indoor unit connected with a remote controller to the remote controller terminal blocks (A, B) of the other indoor unit. (No polarity)
- For address setup, refer to the Installation Manual attached to the outdoor unit.

10 TEST RUN

Before test operation

- Before turning on the power supply, carry out the following items.
  1) Using 500V-megger, check there is 1MΩ or more between the terminal block of the power supply and the earth. If 1MΩ or less is detected, do not run the unit.
  2) Check that all the valves of the outdoor unit are fully opened.
- Never push the electromagnetic contactor to carry out a forced test operation. (It is very dangerous because a protective device does not work.)

WARNING

To protect the compressor at starting time, keep power-ON condition before 12 hours or more.

How to execute test operation

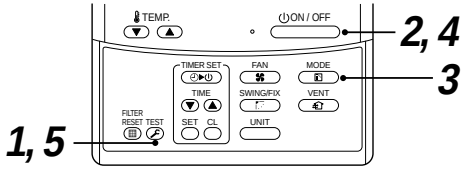
- To carry out a fan operation in a single indoor unit, turn off the power once, short CN72 on P.C. board, and then turn on the power again. (Start the unit in FAN mode.) In this case, do not forget to clear short-circuit of CN72 after test operation.
- Using the remote controller, check the operation in the usual operation. For the operation procedure, refer to the attached Owner's Manual.

  A forced test operation can be executed in the following procedure under condition of thermo-OFF of room temperature.

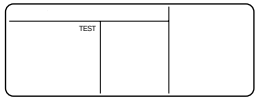
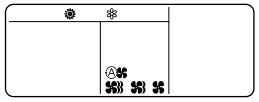
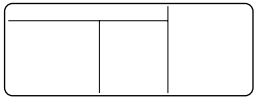
  In order to prevent a serial operation, the forced test operation is released after 60 minutes and returns to the usual operation.

NOTE

Do not use a forced operation in cases other than test operation because it applies an excessive load to the air conditioner.

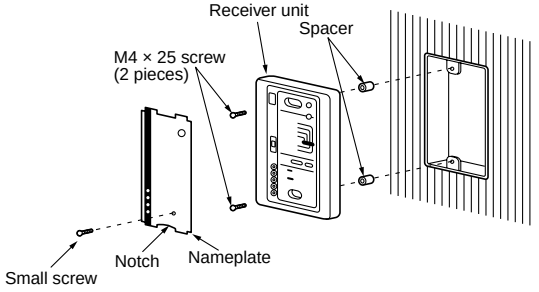


In case of wired remote controller

Procedure	Description	
1	Keep TEST button pushed for 4 seconds or more. [TEST] is displayed on the display part and the selection of mode in the test mode is permitted.	
2	Push ON / OFF button.	
3	Using MODE button, select the operation mode, [COOL] or [HEAT]. • Do not run the air conditioner in a mode other than [COOL] or [HEAT]. • The temperature controlling function does not work during test operation. • The detection of error is performed as usual.	
4	After the test operation, push ON / OFF button to stop the operation. (Display part is same as procedure *1*)	
5	Push TEST button to cancel (release from) the test operation mode. ([TEST] disappears on the display part and the status returns to a normal stop status.)	

In case of wireless remote controller

Procedure	Description
1	Remove a small screw which fixes the nameplate of the receiver unit. Remove the nameplate of the sensor section by inserting a minus screwdriver, etc into the notch at the bottom of the plate, and set the Dip switch to [TEST RUN ON].
2	Execute a test operation with button on the wireless remote controller. • (1), (2), and LED flash during test operation. • Under status of [TEST RUN ON], the temperature adjustment from the wireless remote controller is invalid. Do not use this method in the operation other than test operation because the equipment is damaged.
3	Use either COOL or HEAT operation mode for a test operation. * The outdoor unit does not operate approx. 3 minutes after power-ON and operation stop.
4	After the test operation finished, stop the air conditioner from the wireless remote controller, and return Dip switch of the receiver section as before. (A 60-minutes timer clearing function is attached to the receiver section in order to prevent a continuous test operation.)



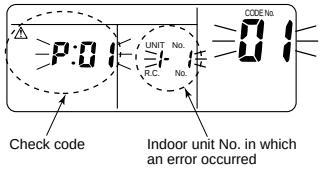
11 TROUBLESHOOTING

Confirmation and check

When a trouble occurred in the air conditioner, the check code and the indoor unit No. appear on the display part of the remote controller.

The check code is only displayed during the operation.

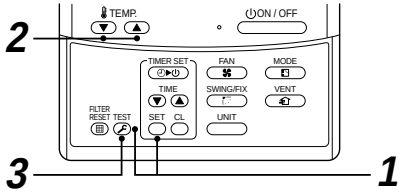
If the display disappears, operate the air conditioner according to the following “Confirmation of error history” for confirmation.

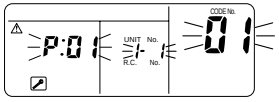


Confirmation of error history

When a trouble occurred on the air conditioner, the error history can be confirmed with the following procedure.
(The error history is stored in memory up to 4 errors.)

This history can be confirmed from either operating status or stop status.



Procedure	Description	
1	When pushing SET and TEST buttons simultaneously for 4 seconds or more, the right display appears. If [Service Check] is displayed, the mode enters in the error history mode. • [01: Order of error history] is displayed in CODE No. window. • [Check Code] is displayed in CHECK window. • [Indoor unit address in which an error occurred] is displayed in UNIT No.	
2	Every pushing (▼), (▲) buttons, the error history stored in the memory is displayed in order. The numbers in CODE No. indicates CODE No. [01] (Latest) → [04] (Oldest). **CAUTION** Do not push CL button because all the error history of the indoor unit will be deleted.	
3	After confirmation, push TEST button to return to the usual display.	

Check method

On the remote controller (Main remote controller, Central control remote controller) and the interface P.C. board of the outdoor unit (I/F), a check display LCD (Remote controller) or 7-segment display (on the outdoor interface P.C. board) to display the operation is provided. Therefore the operation status can be known. Using this self-diagnosis function, a trouble or position with error of the air conditioner can be found as shown in the table below.

Check code list

The following list shows each check code. Find the check contents from the list according to part to be checked.
- In case of check from indoor remote controller: See “Main remote controller display” in the list.
- In case of check from outdoor unit: See “Outdoor 7-segment display” in the list.
- In case of check from AI-NET central control remote controller: See “AI-NET central control display” in the list.
- In case of check from indoor unit with wireless remote controller: See “Sensor block display of receiving unit” in the list.

Terminology

AI-NET : Artificial Intelligence.
IPDU : Intelligent Power Drive Unit
○ : Lighting, ¤ : Flashing, ● : Goes off
ALT. : Flashing is alternately when there are two flashing LED.
SIM : Simultaneous flashing when there are two flashing LED.

Check code				Wireless remote controller				Check code name	Judging device
Main remote controller display	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Auxiliary code		Operation	Timer	Ready	Flash		
E01	—	—	—	¤	●	●		Communication error between indoor and remote controller (Detected at remote controller side)	Remote controller
E02	—	—	—	¤	●	●		Remote controller transmission error	Remote controller
E03	—	—	97	¤	●	●		Communication error between indoor and remote controller (Detected at indoor side)	Indoor
E04	—	—	04	●	●	¤		Communication circuit error between indoor/ outdoor (Detected at indoor side)	Indoor
E06	E06	No. of indoor units in which sensor has been normally received	04	●	●	¤		Decrease of No. of indoor units	I/F
—	E07	—	—	●	●	¤		Communication circuit error between indoor/ outdoor (Detected at outdoor side)	I/F
E08	E08	Duplicated indoor addresses	96	¤	●	●		Duplicated indoor addresses	Indoor / I/F
E09	—	—	99	¤	●	●		Duplicated main remote controllers	Remote controller
E10	—	—	CF	¤	●	●		Communication error between indoor MCU	Indoor
E12	E12	01: Indoor/Outdoor communication 02: Communication between outdoor units	42	¤	●	●		Automatic address start error	I/F
E15	E15	—	42	●	●	¤		Indoor is nothing during automatic addressing	I/F
E16	E16	00: Capacity over 01 ~:No. of connected units	89	●	●	¤		Capacity over / No. of connected indoor units	I/F
E18	—	—	97, 99	¤	●	●		Communication error between indoor units	Indoor
E19	E19	00: Header is nothing 02: Two or more header units	96	●	●	¤		Outdoor header units quantity error	I/F
E20	E20	01: Outdoor of other line connected 02: Indoor of other line connected	42	●	●	¤		Other line connected during automatic address	I/F
E23	E23	—	15	●	●	¤		Sending error in communication between outdoor units	I/F
E25	E25	—	15	●	●	¤		Duplicated follower outdoor addresses	I/F
E26	E26	No. of outdoor units which received signal normally	15	●	●	¤		Decrease of No. of connected outdoor units	I/F
E28	E28	Detected outdoor unit number	d2	●	●	¤		Follower outdoor unit error	I/F
E31	E31	01: IPDU1 error 02: IPDU2 error 03: IPDU1, 2 error 04: Fan IPDU error 05: IPDU + Fan IPDU error 06: IPDU2 + Fan IPDU error 07: All IPDU error	CF	●	●	¤		IPDU communication error	I/F

11 TROUBLESHOOTING

Check code			AI-NET central control display	Wireless remote controller				Check code name	Judging device
Main remote controller display	Outdoor 7-segment display			Sensor block display of receiving unit					
		Auxiliary code		Operation	Timer	Ready	Flash		
F01	—	—	0F	☼	☼	●	ALT	Indoor TCJ sensor error	Indoor
F02	—	—	0d	☼	☼	●	ALT	Indoor TC2 sensor error	Indoor
F03	—	—	93	☼	☼	●	ALT	Indoor TC1 sensor error	Indoor
F04	F04	—	19	☼	☼	○	ALT	TD1 sensor error	I/F
F05	F05	—	A1	☼	☼	○	ALT	TD2 sensor error	I/F
F06	F06	—	18	☼	☼	○	ALT	TE1 sensor error	I/F
F07	F07	—	18	☼	☼	○	ALT	TL sensor error	I/F
F08	F08	—	1b	☼	☼	○	ALT	TO sensor error	I/F
F10	—	—	OC	☼	☼	●	ALT	Indoor TA sensor error	Indoor
F12	F12	—	A2	☼	☼	○	ALT	TS1 sensor error	I/F
F13	F13	01: Comp. 1 side 02: Comp. 2 side	43	☼	☼	○	ALT	TH sensor error	IPDU
F15	F15	—	18	☼	☼	○	ALT	Outdoor temp. sensor miscabling (TE, TL)	I/F
F16	F16	—	43	☼	☼	○	ALT	Outdoor pressure sensor miscabling (Pd, Ps)	I/F
F23	F23	—	43	☼	☼	○	ALT	Ps sensor error	I/F
F24	F24	—	43	☼	☼	○	ALT	Pd sensor error	I/F
F29	—	—	12	☼	☼	●	SIM	Indoor other error	Indoor
F31	F31	—	1C	☼	☼	○	SIM	Indoor EEPROM error	I/F
H01	H01	01: Comp. 1 side 02: Comp. 2 side	lF	●	☼	●		Compressor break down	IPDU
H02	H02	01: Comp. 1 side 02: Comp. 2 side	1d	●	☼	●		Magnet switch error Overcurrent relay operation Compressor trouble (lock)	MG-SW Overcurrent relay IPDU
H03	H03	01: Comp. 1 side 02: Comp. 2 side	17	●	☼	●		Current detect circuit system error	IPDU
H04	H04	—	44	●	☼	●		Comp 1 case thermo operation	I/F
H06	H06	—	20	●	☼	●		Low pressure protective operation	I/F
H07	H07	—	d7	●	☼	●		Oil level down detective protection	I/F
H08	H08	01: TK1 sensor error 02: TK2 sensor error 03: TK3 sensor error 04: TK4 sensor error	d4	●	☼	●		Oil level detective temp sensor error	I/F
H14	H14	—	44	●	☼	●		Comp 2 case thermo operation	I/F
H16	H16	01: TK1 oil circuit system error 02: TK2 oil circuit system error 03: TK3 oil circuit system error 04: TK4 oil circuit system error	d7	●	☼	●		Oil level detective circuit error Magnet switch error Overcurrent relay operation	I/F MG-SW Overcurrent relay
L03	—	—	96	☼	●	☼	SIM	Indoor center unit duplicated	Indoor
L04	L04	—	96	☼	○	☼	SIM	Outdoor line address duplicated	I/F
L05	—	—	96	☼	●	☼	SIM	Duplicated indoor units with priority (Displayed in indoor unit with priority)	I/F
L06	L06	No. of indoor units with priority	96	☼	●	☼	SIM	Duplicated indoor units with priority (Displayed in unit other than indoor unit with priority)	I/F
L07	—	—	99	☼	●	☼	SIM	Group line in individual indoor unit	Indoor
L08	L08	—	99	☼	●	☼	SIM	Indoor group/Address unset	Indoor, I/F
L09	—	—	46	☼	●	☼	SIM	Indoor capacity unset	Indoor
L10	L10	—	88	☼	○	☼	SIM	Outdoor capacity unset	I/F
L20	L20	—	98	☼	○	☼	SIM	Duplicated central control addresses	AI-NET, Indoor
L28	L28	—	46	☼	○	☼	SIM	Over No. of connected outdoor units	I/F
L29	L29	01: IPDU1 error 02: IPDU2 error 03: IPDU3 error 04: Fan IPDU error 05: IPDU1 + Fan IPDU error 06: IPDU2 + Fan IPDU error 07: All IPDU error	CF	☼	○	☼	SIM	No. of IPDU error	I/F
L30	L30	Detected indoor address	b6	☼	○	☼	SIM	Indoor outside interlock	Indoor
—	L31	—	—		—			Extended I/C error	I/F

Check code			AI-NET central control display	Wireless remote controller				Check code name	Judging device
Main remote controller display	Outdoor 7-segment display			Sensor block display of receiving unit					
		Auxiliary code		Operation	Timer	Ready	Flash		
P01	—	—	11	●	☼	☼	ALT	Indoor fan motor error	Indoor
P03	P03	—	1E	☼	●	☼	ALT	Discharge temp. TD1 error	I/F
P04	P04	01: Comp. 1 side 02: Comp. 2 side	21	☼	●	☼	ALT	High-pressure SW system operation	IPDU
P05	P05	01: Phase-missing detection 02: Phase error	AF	☼	●	☼	ALT	Phase-missing detection /Phase error	I/F
P07	P07	01: Comp. 1 side 02: Comp. 2 side	IC	☼	●	☼	ALT	Heat sink overheat error	IPDU, I/F
P10	P10	Detected indoor address	Ob	●	☼	☼	ALT	Indoor overflow error	Indoor
P12	—	—	11	●	☼	☼	ALT	Indoor fan motor error	Indoor
P13	P13	—	47	●	☼	☼	ALT	Outdoor liquid back detection error	I/F
P15	P15	01: TS condition 02: TD condition	AE	☼	●	☼	ALT	Gas leak detection	I/F
P17	P17	—	bb	☼	●	☼	ALT	Discharge temp. TD2 error	I/F
P19	P19	Detected outdoor unit number	O8	☼	●	☼	ALT	4-way valve inverse error	I/F
P20	P20	—	22	☼	●	☼	ALT	High-pressure protective operation	I/F
P22	P22	0 _: IGBT short 1 _: Fan motor position detective circuit error 3 _: Fan motor trouble C _: TH sensor temp. error (Heat sink overheat) D _: TH sensor error E _: Vdc output error	1A	☼	●	☼	ALT	Outdoor fan IPDU error	IPDU
P26	P26	01: Comp. 1 side 02: Comp. 2 side	14	☼	●	☼	ALT	G-TR short protection error	IPDU
P29	P29	01: Comp. 1 side 02: Comp. 2 side	16	☼	●	☼	ALT	Comp position detective circuit system error	IPDU
P31	P31	—	47	☼	●	☼	ALT	Other indoor unit error (Group terminal unit error)	Indoor
—	—	—	b7	By alarm device			ALT	Error in indoor group	AI-NET
—	—	—	97	—				AI-NET communication system error	AI-NET
—	—	—	99	—				Duplicated network adaptors	AI-NET

Error detected by TCC-LINK central control device

Check code				Wireless remote controller				Check code name	Judging device
Central control device indication	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
	Auxiliary code			Operation	Timer	Ready	Flash		
C05	—	—	—	—				Sending error in TCC-LINK central control device	TCC-LINK
C06	—	—	—	—				Receiving error in TCC-LINK central control device	TCC-LINK
C12	—	—	—	—				Batch alarm of general-purpose equipment control interface	General-purpose equipment I/F
P30	Differs according to error contents of unit with occurrence of alarm							Group control branching unit error	TCC-LINK
	—	—	(L20 is displayed.)					Duplicated central control addresses	

Terminology

TCC-LINK : TOSHIBA Carriea Cominication Link.

11 TROUBLESHOOTING

New check code

1. Difference between the new check code and the current system

The displaying method of the check code changes in this model and after.

	Check code in current system	New check code
Used characters	Hexadecimal notation, 2 digits	Alphabet + Decimal notation, 2 digits
Characteristics of code classification	Few classification of communication/incorrect setup system	Many classification of communication/incorrect setup system
Block display	Indoor P.C. board, Outdoor P.C. board, Cycle, Communication	Communication/Incorrect setup (4 ways), Indoor protection, Outdoor protection, Sensor, Compressor protection, etc.

<Display on wired remote controller>

- [⚠] goes on.
- [UNIT No.] + Check code + Operation lamp (Green) flash

<Display on sensor part of wireless>

- Block display of combination of [🕘] [⏻] [❁]

<Display on indicater on wiress remote controller receiver part>

- Unit No. and check code are displayed.
- In a case of error with auxiliary code, check code and auxiliary code are displayed alternately.

Display	Classification
A	Unused
C	Central control system error
E	Communication system error
F	Each sensor error (Failure)
H	Compressor protective system error
J	Unused
L	Setup error, Other errors
P	Protective device operation

12 MAINTENANCE

For maintenance, be sure to turn off the main power switch.

⚠ CAUTION

Do not handle the buttons with wet hands; otherwise an electric shock may be caused.

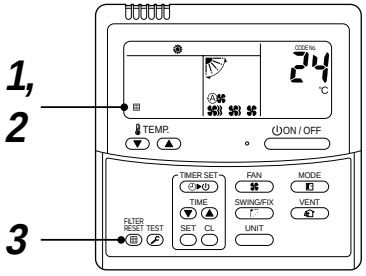
<Daily maintenance>

Cleaning of air filter

1 **If ▦ is displayed on the remote controller, contact to service on maintenance professional to cleaning the air filter.**

2 **Clogging of the air filter decreases cooling/ heating efficiency.**

3 **After cleaning, push ▣ .**
▦ display disappears.



[Air filter cleaning method]

1 **Take out the air filter.**
- When connecting a return air duct to the unit, cleaning method of the air filter differs according to the construction of duct end. Please ask the constructor for construction of air duct.

2 **Cleaning with water or vacuum cleaner**
- If dirt is heavy, clean the air filter by tepid water with neutral detergent or water.
- After cleaning with water, dry the air filter sufficiently in a shade place.

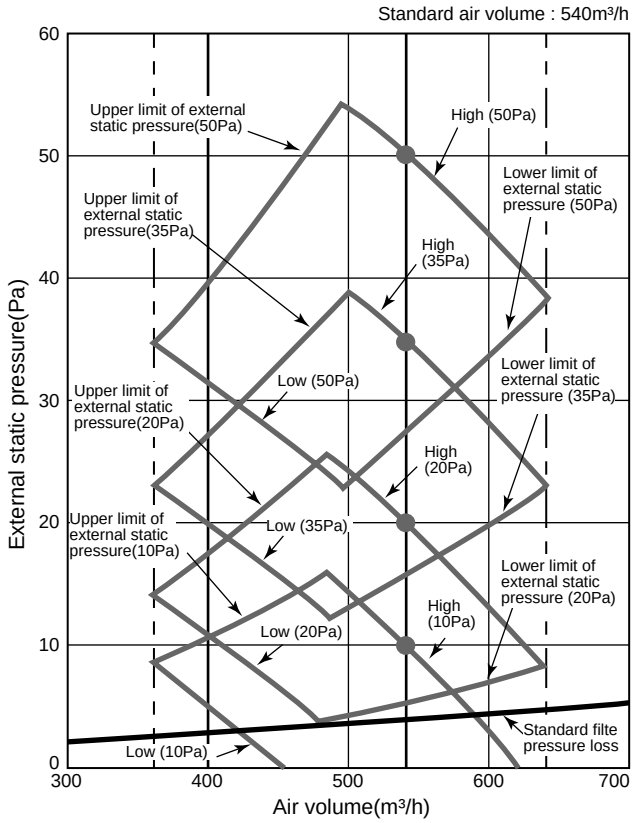
3 **Mount the air filter.**
- Attach the filter to the main unit.

4 **Push ▣.**
- ▦ display disappears.

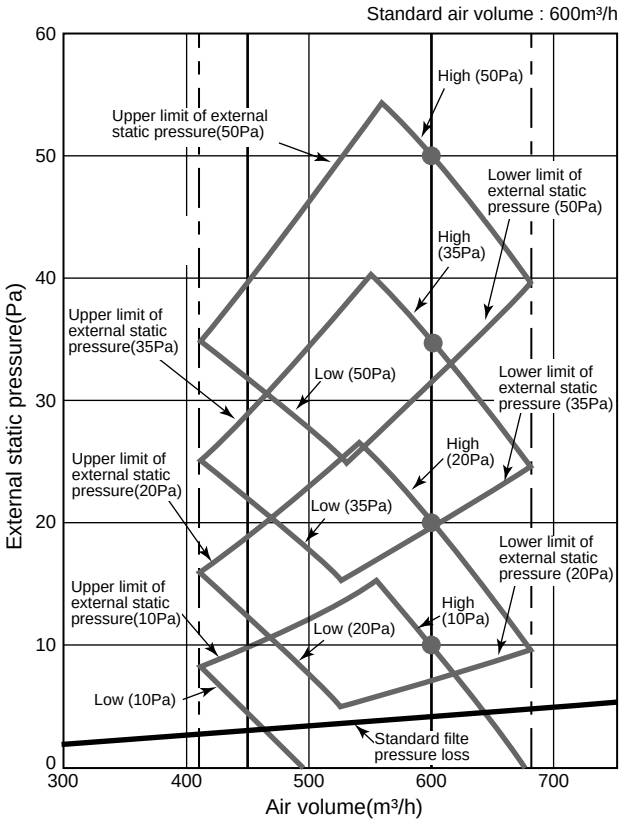
4. FAN CHARACTERISTICS

Slim Duct (Filter attached)

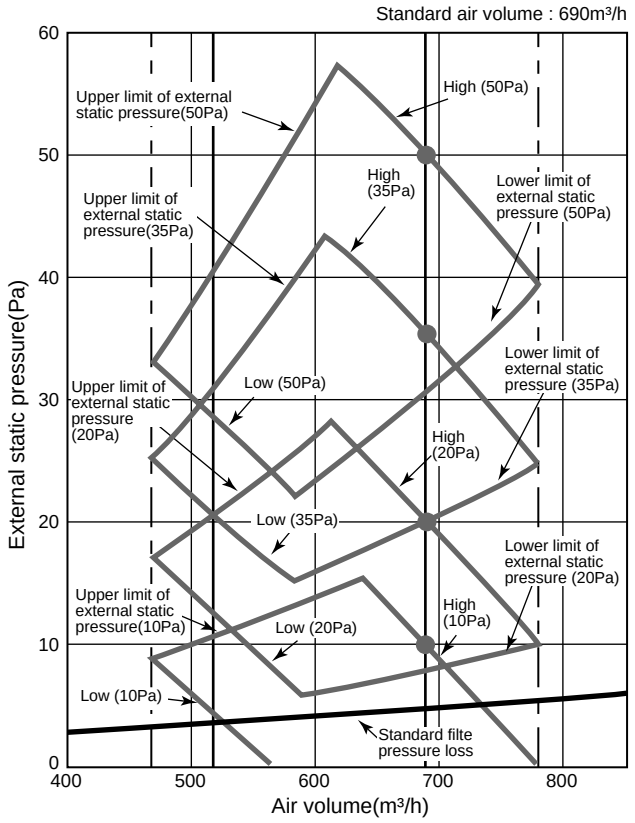
MMD-AP0071SPH, SH
MMD-AP0091SPH, SH



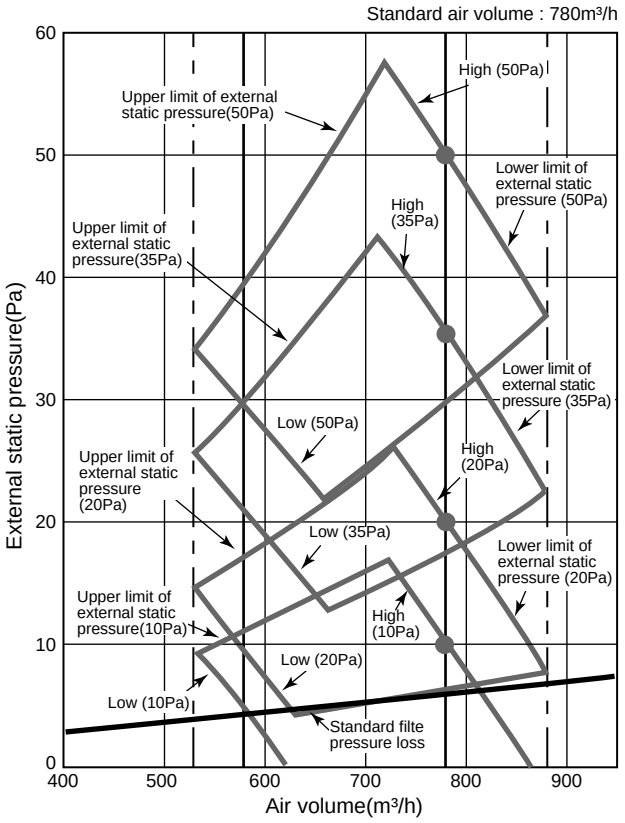
MMD-AP0121SPH, SH



MMD-AP0151SPH, SH

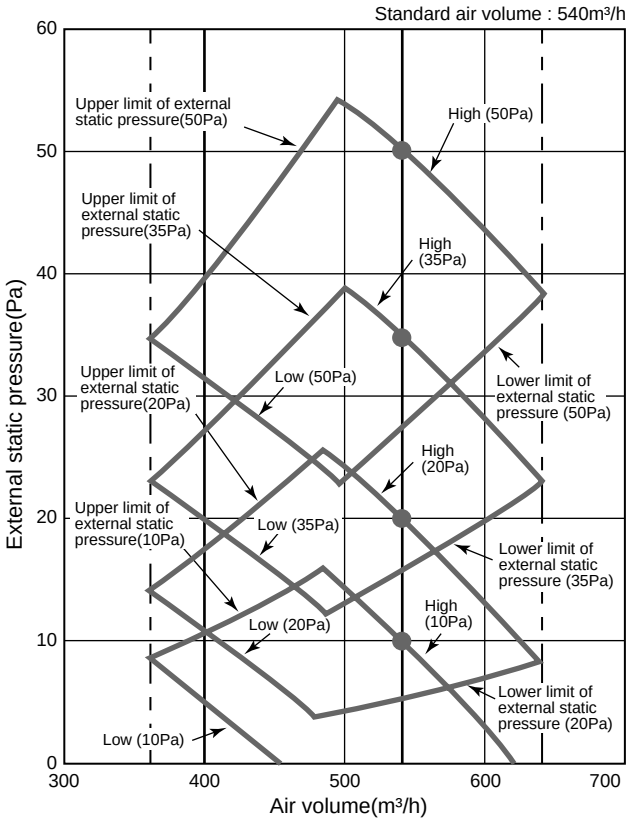

Standard air volume : 690m³/h
External static pressure(Pa)
Air volume(m³/h)
Upper limit of external static pressure(50Pa)
High (50Pa)
High (35Pa)
Lower limit of external static pressure (50Pa)
Upper limit of external static pressure(35Pa)
Low (50Pa)
Lower limit of external static pressure (35Pa)
Upper limit of external static pressure (20Pa)
High (20Pa)
Low (35Pa)
Lower limit of external static pressure (20Pa)
Upper limit of external static pressure(10Pa)
High (10Pa)
Low (20Pa)
Low (10Pa)
Standard filte pressure loss

MMD-AP0181SPH, SH

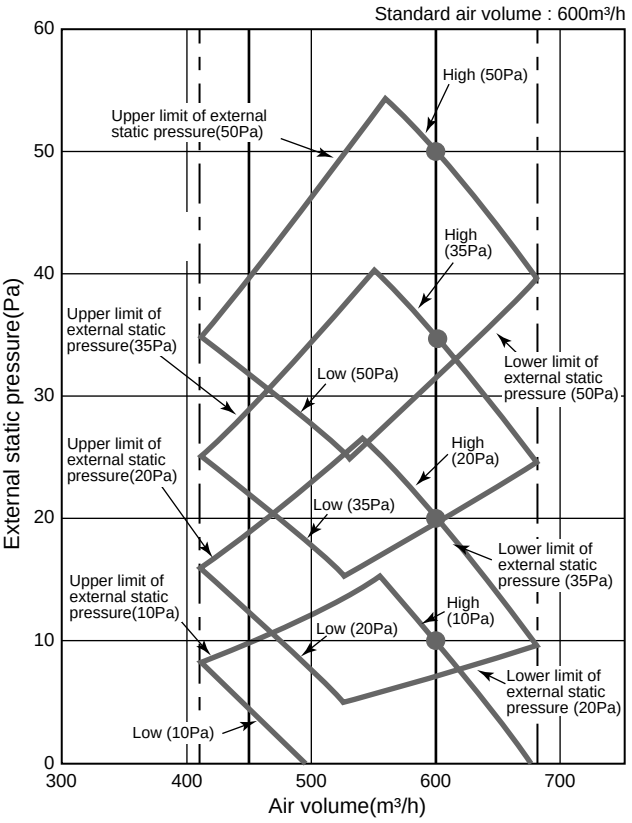

Standard air volume : 780m³/h
External static pressure(Pa)
Air volume(m³/h)
High (50Pa)
Upper limit of external static pressure(50Pa)
Lower limit of external static pressure (50Pa)
High (35Pa)
Upper limit of external static pressure(35Pa)
Low (50Pa)
Lower limit of external static pressure (35Pa)
Upper limit of external static pressure (20Pa)
High (20Pa)
Low (35Pa)
Lower limit of external static pressure (20Pa)
Upper limit of external static pressure(10Pa)
High (10Pa)
Low (20Pa)
Low (10Pa)
Standard filte pressure loss

Slim Duct

MMD-AP0071SPH, SH
MMD-AP0091SPH, SH



MMD-AP0121SPH, SH



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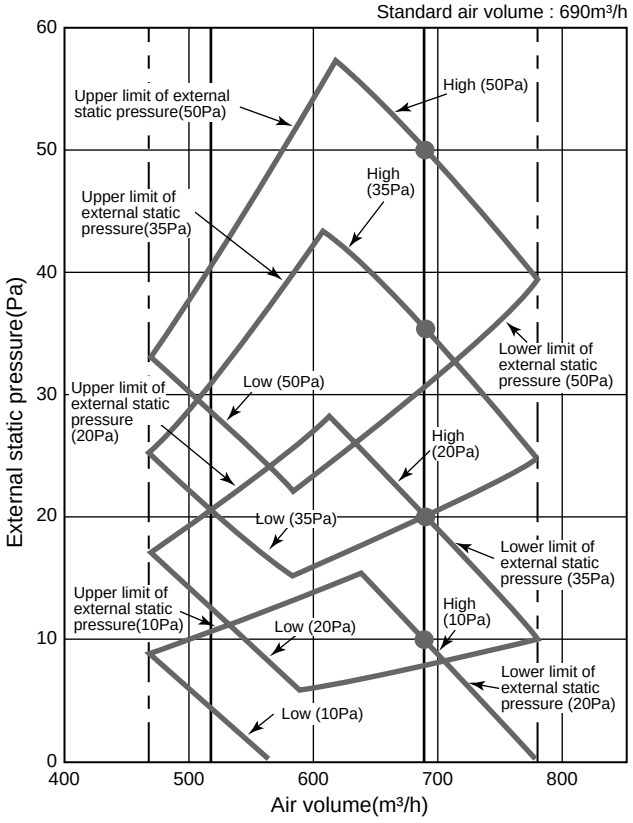
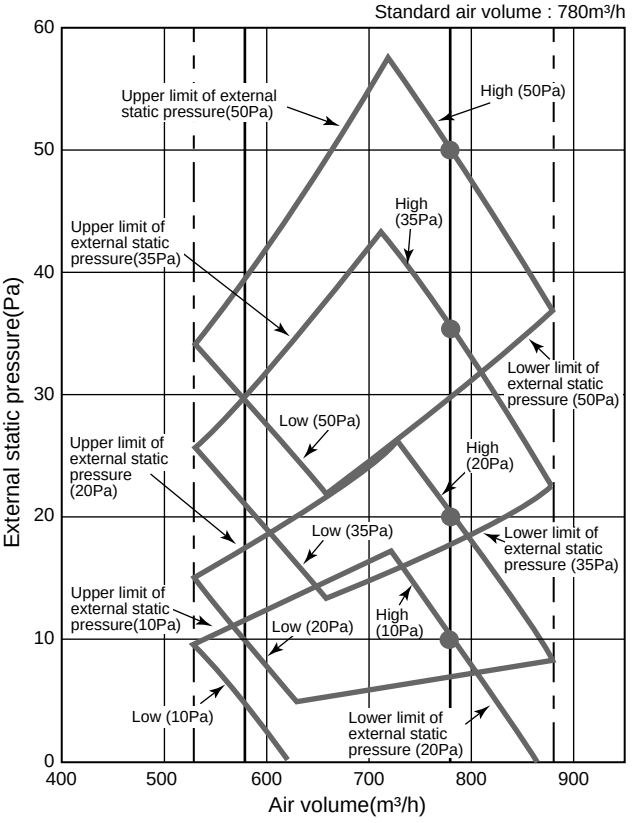
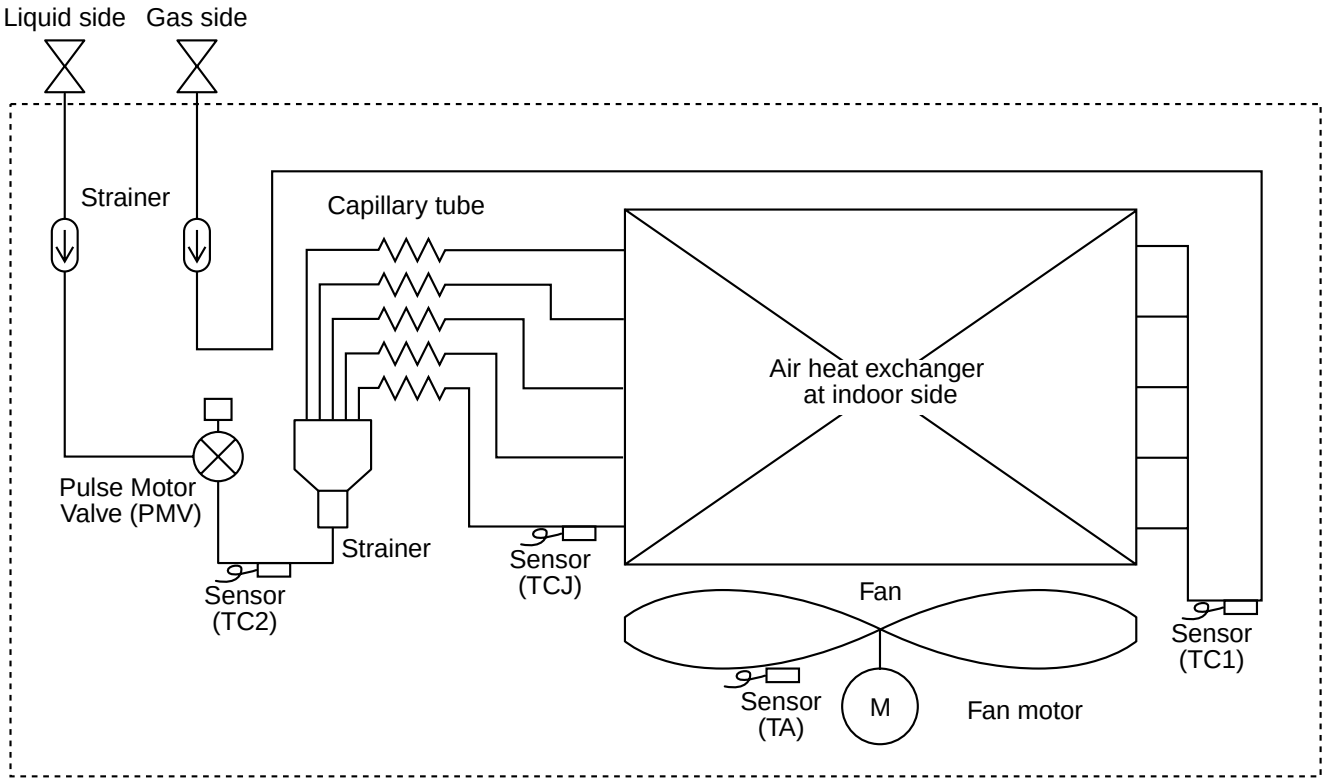


MMD-AP0181SPH, SH



5. REFRIGERANTING CYCLE DIAGRAM

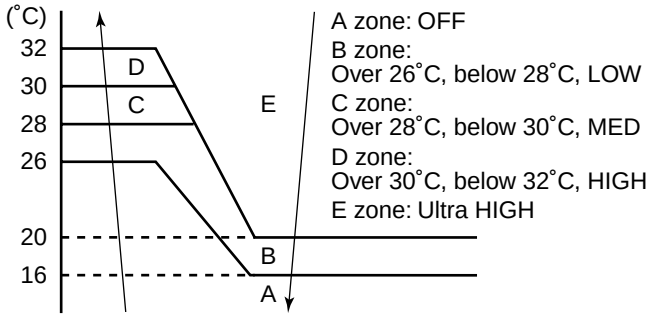
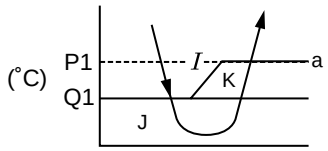


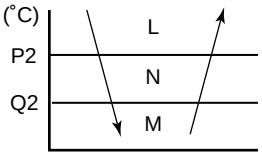
Functional part name		Functional outline
Pulse Motor Valve	PMV	(Connector CN082 (6P): Blue) 1) Controls super heat in cooling operation 2) Controls under cool in heating operation 3) Recovers refrigerant oil in cooling operation 4) Recovers refrigerant oil in heating operation
Temp. sensor	1. TA	(Connector CN104 (2P): White) 1) Detects indoor suction temperature
	2. TC1	(Connector CN100 (3P): Brown) 1) Controls PMV super heat in cooling operation
	3. TC2	(Connector CN101 (2P): Blue) 1) Controls PMV under cool in heating operation
	4. TCJ	(Connector CN102 (2P): Yellow) 1) Controls PMV super heat in cooling operation

6. CONTROL OUTLINE

6-1. Control Specifications

<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>1</td><td>Power supply is reset.</td><td>(1) Distinction of outdoor unit
When the power supply is reset, the outdoor units are distinguished, and control is exchanged according to the distinctive results.
(2) Check code clear
When the power supply is reset, the check code is also reset once. If an abnormal status which the check code appears after Start/Stop button of the remote controller has been pushed continues, the check code is displayed again on the remote controller.</td><td></td></tr>
<tr><td>2</td><td>Operation select</td><td>(1) Based upon the operation select command from the remote controller or central controller, the operation mode is selected.
<table>
<tr><th>Remote controller command</th><th>Control outline</th></tr>
<tr><td>STOP</td><td>Stops air conditioner.</td></tr>
<tr><td>FAN</td><td>Fan operation</td></tr>
<tr><td>COOL</td><td>Cooling operation</td></tr>
<tr><td>DRY</td><td>Dry operation ∗</td></tr>
<tr><td>HEAT</td><td>Heating operation</td></tr>
<tr><td>COOL/HEAT AUTO</td><td>COOL/HEAT AUTO operation</td></tr>
</table>
Heating operation is automatically selected with difference between setup temperature and room temperature.</td><td></td></tr>
<tr><td>3</td><td>Room temp. control</td><td>(1) Adjustment range Set temperature on remote controller (°C)
<table>
<tr><th></th><th>Allcooling</th><th>All heating</th></tr>
<tr><td>Wired type</td><td>18 to 29°C</td><td>18 to 29°C</td></tr>
<tr><td>Wireless type</td><td>18 to 30°C</td><td>16 to 30°C</td></tr>
</table>
(2) From the item code 06, the setup temperature in heating operation can be corrected.
<table>
<tr><td>Setup data</td><td>0</td><td>2</td><td>4</td><td>6</td></tr>
<tr><td>Setup temp. correction</td><td>+0°C</td><td>+2°C</td><td>+4°C</td><td>+6°C</td></tr>
</table>
Setup at shipment
<table>
<tr><td>Setup data</td><td>2</td></tr>
</table></td><td>Heating suction temperature shift</td></tr>
<tr><td>4</td><td>Automatic capacity control</td><td>(1) Based upon difference between Ta and Ts, the operation frequency is indicated to the outdoor unit.</td><td></td></tr>
<tr><td>5</td><td>Air volume control</td><td>(1) By the command from the remote controller, “HIGH (HH)”, “MED (H)”, or “LOW (L)” “AUTO” operation is executed.
(2) While air speed is in AUTO mode, the air speed is changed according to the difference between Ta and Ts.</td><td>HH > H+ > H > L+ > L > LL</td></tr>
</table>

<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>6</td><td>Prevention of cold air discharge</td><td>(1) In all heating operation, the upper limit of the fan tap is set by one with higher temperature of TC2 sensor and TCJ sensor.
• When B zone has continued for 6 minutes, the operation shifts to C zone.
• In defrost time, the control point is set to +6°C.
 
</td><td>• In D and E zones, priority is given to remote controller air speed setup.
• In A and B zones, “❁” is displayed.</td></tr>
<tr><td>7</td><td>Freeze prevention control (Low temp. release)</td><td>(1) In all cooling operation, the air conditioner operates as described below based upon temp. detected by TC1, TC2 and TCJ sensors.
To prevent the heat exchanger from freezing, the operation stops.
• When “J” zone is detected for 5 minutes, the command frequency becomes “S0” to the outdoor unit.
• In “K” zone, the timer count is interrupted, and held.
• When “I” zone is detected, the timer is cleared and the operation returns to the normal operation.
• When the command frequency became S0 with continuation of “J” zone, operation of the the indoor fan in LOW mode until it reaches the “I” zone.
It is reset when the following conditions are satisfied.
Reset conditions
1) TC1 ≥ 12°C and TC2 ≥ 12°C and TCJ ≥ 12°C
2) 30 minutes passed after stop.
 

<table>
<tr><th></th><th>TC1</th></tr>
<tr><td>P1</td><td>10°C (5°C)</td></tr>
<tr><td>Q1</td><td>0°C</td></tr>
</table>
(2) In all cooling operation, the air conditioner operates as described below based upon temp. detected by TC2 and TCJ sensors.
• When “M” zone is detected for 45 minutes, the command frequency becomes “S0” to the outdoor unit.
• In “N” zone, the timer count is interrupted and held.
• When shifting to “M” zone again, the timer count restarts and continues.
• If “L” zone is detected, the timer is cleared and the operation returns to normal operation.
Reset conditions
1) TC1 ≥ 12°C and TC2 ≥ 12°C and TCJ ≥ 12°C
2) 30 minutes passed after stop.
 

<table>
<tr><th></th><th>TC2, TCJ</th></tr>
<tr><td>P2</td><td>5°C</td></tr>
<tr><td>Q2</td><td>–2.0°C</td></tr>
</table></td><td>∗ In a Model without TC2, TC2 is not judged.</td></tr>
</table>

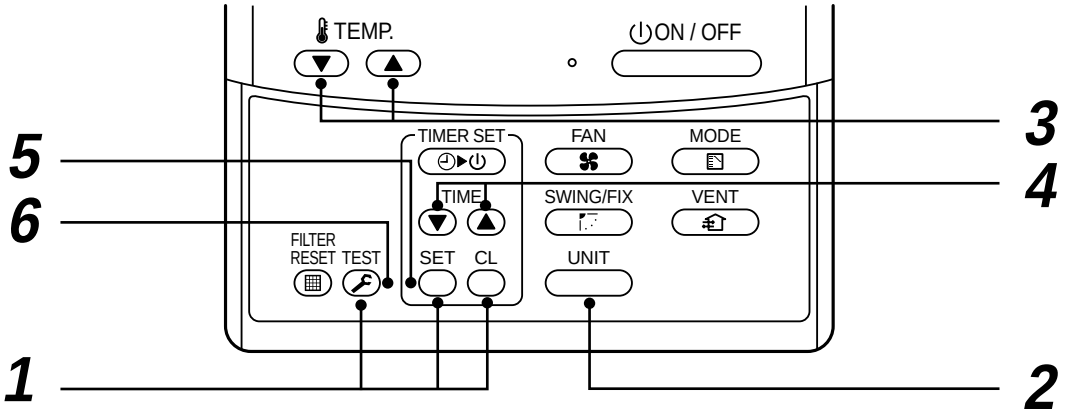
No.	Item	Outline of specifications	Remarks
8	Recovery control for cooling refrigerant and oil	(1) The indoor unit which stops operation, thermostat is OFF, or operates in FAN mode opens PMV of the indoor unit by the specified opening degree when cooling refrigerant or oil recovery signal is received from the outdoor unit. (2) Drain pump of 4-way air discharge cassette type and concealed duct type operate during recovery control mode.	• Recovery operation is usually executed every 2 hours.
9	Recovery control for heating refrigerant and oil	The indoor unit which stops operation, thermostat is OFF, or operates in FAN mode performs the following controls when the heating refrigerant/Oil recovery signal is received from the outdoor unit. 1) Opens PMV of the indoor unit by the specified opening degree. 2) Stops the fan. 3) Only 4-way Air Discharge Cassette type air conditioner rotates the indoor fan with intermittent operation for approx. 1 minute after recovery control. 4) Only 4-way Air Discharge Cassette type air conditioner rotates the indoor fan with intermittent operation for approx. 1 minute after recovery control as the outdoor unit. 5) After recovery control, drain pump of 4-way air discharge cassette type and cobcealed duct type will operate.	• In the indoor unit which thermostat is OFF, or operates in FAN mode, "⏻" lamp goes on. • Recovery operation is usually executed every 1 hour.
10	Short intermittent operation compensation control	(1) For 5 minutes after the operation has started, the operation is continued even if entering thermostat-OFF condition. (2) However, if the thermostat has been turned off by changing the set up temp., the thermostat is OFF with even the above condition. The protective control has priority.	
11	Drain pump control	(1) During "COOL" operation (including DRY operation), the drain pump operates. (2) While the drain pump operates, if the float switch works, the drain pump continues operation and a check code is displayed. (3) While the drain pump stops, if the float switch works, turn off the capacity demand command, stop the operation, and operate the drain pump. If the float switch continues operating for approx. 5 minutes, the operation stops and the check code is displayed. (4) In heating operation, if humidifier "provided" is judged, compressor "ON", compressor "ON", fan "ON", and MAX (TC2, TCJ) ≥ 33°C, the drain pump operates.	Check code [P10] When CN70 is connected or the item code 40 setup data is 1, the setup becomes humidifier "provided", and the drain pump operates with the left conditions.
12	Elimination of remaining heat	(1) When the air conditioner stops in the "HEAT" mode, drive the indoor fan with "LOW" mode for approx. 30 seconds.	
13	Filter sign display (None in wireless type) ∗ Provided in the separately laid type TCB-AX21E.	(1) The operation time of the indoor fan is integrated and stored in memory, and the filter exchange signal is sent to the remote controller to display on the remote controller LCD after the specified time. (2) When the filter reset signal is received form the remote controller, time of the integrated timer is cleared. In this time, if the specified time has passed, the measured time is reset and LCD display disappears.	

No.	Item	Outline of specifications	Remarks
14	"⏻" and "❋" display (Operation and heating stand-by)	**<Operation standby> .....** Display on remote controller (1) • "P05" is one of displays of power wire missing. • "P05" of power cable is detected. • "COOL/DRY" operation cannot be performed because the other indoor unit is under "HEAT" operation. • "HEAT" operation cannot be performed because COOL priority is set (Outdoor I/F P.C. board SW11 1-bit is ON) and the other indoor unit is under "COOL/DRY" operation. • "FAN" operation cannot be performed because the system performs "Heat oil/Refrigerant recovery" operation. • There is a unit in which indoor overflow "P10" is detected. • There is a unit in which interlock alarm "P23" is detected. (2) The above indoor units unavailable to operate waits under condition of thermostat OFF. **<HEAT standby> .....** Display on remote controller (1) • HEAT thermostat is OFF. • During HEAT operation, the fan rotates with lower air speed than one specified in order to prevent discharge of cold draft or stops. (including case that defrost operation is being performed) • "HEAT" operation cannot be performed because COOL priority is set (Outdoor I/F P.C. board SW11 bit 1 is ON) and the other indoor unit is under "COOL/DRY" operation. (2) "HEAT standby" is displayed until the above conditions are released.	• "⏻" goes on. • "❋" goes on.
15	Selection of central control mode	(1) The contents which can be changed on the remote controller at indoor unit side can be selected by setup at the central controller side. (2) In case of operation from TCC-LINK central controller (TCB-SC642TLE, etc.) **[Central control mode 1]** : Cannot operate **[Central control mode 2]** : Cannot operate, stop, select mode, set up temp. **[Central control mode 3]** : Cannot select mode, set up temp. **[Central control mode 4]** : Cannot select mode (3) RBC-AMT21E (Wired remote controller) While mode is the central control mode, "CENTRAL" lights on the display part of the remote controller.	If operation is performed from the remote control "CENTRAL CONTROL" mode, the status is notified with receiving sound.

7. APPLIED CONTROL

7-1. Setup of Selecting Function in Indoor Unit (Be sure to Execute Setup by a Wired Remote Controller)

<Procedure> Execute the setup operation while the unit stops.



1 **Push SET, CL, and TEST buttons simultaneously for 4 seconds or more.**
The firstly displayed unit No. indicates the header indoor unit address in the group control.
In this time, the fan of the selected indoor unit is turned on.

2 **Every pushing UNIT button, the indoor unit numbers in the group control are successively displayed. In this time, the fan of the selected indoor unit only is turned on.**

3 **Specify the item code (DN) using the setup temperature ▼ and ▲ buttons.**

4 **Select the setup data using the timer time ▼ and ▲ buttons.**

(When selecting the DN code to "33", change the temperature indication of the unit from "°C" to "°F" on the remote controller.)

5 **Push SET button. (OK if display goes on.)**
- To change the selected indoor unit, return to procedure ***2***.
- To change the item to be set up, return to procedure ***3***.

6 **Pushing TEST button returns the status to normal stop status.**

Table: Function selecting item code (DN)
(Items necessary to perform the applied control at the local site are described.)

DN	Item	Description	At shipment
01	Filter display delay timer	0000 : None 0001 : 150H 0002 : 2500H 0003 : 5000H 0004 : 10000H	According to type
02	Dirty state of filter	0000 : Standard 0001 : High degree of dirt (Half of standard time)	0000 : Standard
03	Central control address	0001 : No.1 unit to 0064 : No.64 unit 0099 : Unfixed	0099 : Unfixed
04	Specific indoor unit priority	0000 : No priority 0001 : Priority	0000 : No priority
06	Heating temp shift	0000 : No shift 0001 : +1°C 0002 : +2°C to 0010 : +10°C (Up to +6 recommended)	0002 : +2°C (Floor type 0000: 0°C)
0d	Existence of [AUTO] mode	0000 : Provided 0001 : Not provided (Automatic selection from connected outdoor unit)	0001 : Not provided
0F	Cooling only	0000 : Heat pump 0001 : Cooling only (No display of [AUTO] [HEAT])	0000 : Heat pump
10	Type	0000 : (1-way air discharge cassette) 0001 : (4-way air discharge cassette) to 0037	According to model type
11	Indoor unit capacity	0000 : Unfixed 0001 to 0034	According to capacity type
12	Line address	0001 : No.1 unit to 0030 : No.30 unit	0099 : Unfixed
13	Indoor unit address	0001 : No.1 unit to 0064 : No.64 unit	0099 : Unfixed
14	Group address	0000 : Individual 0001 : Header unit of group 0002 : Follower unit of group	0099 : Unfixed
19	Louver type (Adjustment of air direction)	0000 : Not provided 0001 : Swing only 0004 : [4-way Air Discharge Cassette type] and [Under Ceiling type]	According to type
1E	Temp difference of [AUTO] mode selection COOL → HEAT, HEAT →COOL	0000 : 0 deg to 0010 : 10 deg (For setup temperature, reversal of COOL/HEAT by ± (Data value)/2)	0003 : 3 deg (Ts±1.5)
28	Automatic restart of power failure	0000 : None 0001 : Restart	0000 : None
29	Operation condition of humidifier	0000 : Usual 0001 : Condition ignored (Detection control for heat exchanger temperature)	0000 : Usual
2A	Selection of option/ error input (CN70)	0000 : Filter input 0001 : Alarm input (Air washer, etc.) 0002 : None	0002 : None
2E	HA terminal (CN61) select	0000 : Usual 0001 : Leaving-ON prevention control	0000 : Usual (HA terminal)
30	Automatic elevating grille	0000 : Unavailable 0001 : Available	0000 : Unavailable
31	Ventilating fan control	0000 : Unavailable 0001 : Available	0000 : Unavailable
32	TA sensor selection	0000 : Body TA sensor 0001 : Remote controller sensor	0000 : Body TA sensor
33	Temperature unit select	0000 : °C (at factory shipment) 0001 : °F	0000 : °C
40	Drain pump control	0000 : None 0001 : Pump ON 0002 : None 0003 : Pump OFF	0003 : Pump OFF
5d	High ceiling selection (Air volume selection)	[4-way Air Discharge Cassette type] and [Under Ceiling type] 0000 : Standard filter 0001 : Super-long life filter 0003 : High efficiency filter [Concealed Duct Standard type] 0000 : Standard static pressure (40Pa) 0001 : High static pressure 1 (70Pa) 0003 : High static pressure 2 (100Pa) 0005 : Correspond to quiet sound 0006 : Low static pressure (20Pa)	0000 : Standard
60	Timer set (Wired remote controller)	0000 : Available (Operable) 0001 : Unavailable (Operation prohibited)	0000 : Available
62	Anti-ceiling smudging control	0000 : Clear	4- way Air Discharge Cassette type only

TYPE

Item code [10]

Setup data	Type	Abbreviated Model name
0005	Slim Duct	MMD-AP XXX SPH, SH

Indoor unit capacity

Item code [11]

Setup data	Model
0001	007
0003	009
0005	012
0007	015
0009	018

7-2. Applied Control in Indoor Unit

■ Remote location ON/OFF control box (TCB-IFCB-4E)

[Wiring and setup]

- Use the exclusive connector for connection with the indoor control P.C. board.
- In a group control, the system can operate when connecting with any indoor unit (Control P.C. board) in the group. However when taking out the operation/error signal from the other unit, it is necessary to take out from each unit individually.

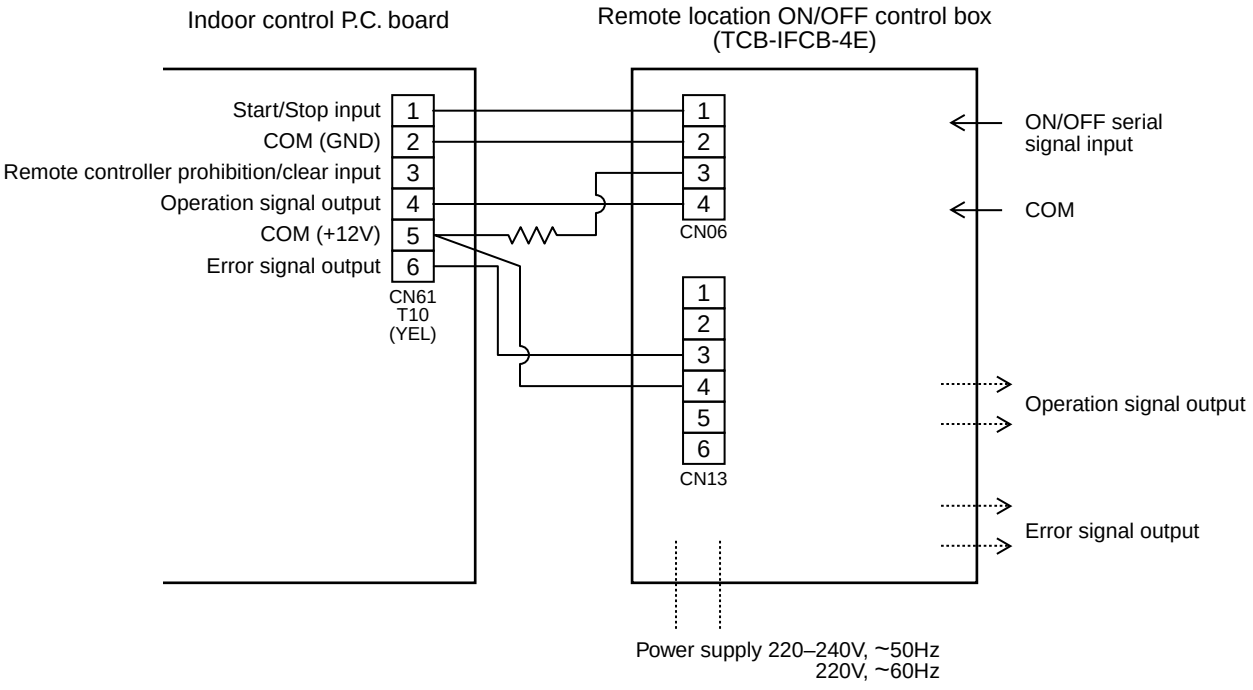
(1) Control items

1) Start/Stop input signal : Operation start/stop in unit
2) Operation signal : Output during normal operation
3) Error signal : Output during alarm
(Serial communication error or indoor/outdoor protective device) operation

(2) Wiring diagram using remote control interface (TCB-IFCB-4E)

Input IFCB-4E : No voltage ON/OFF serial signal

Output No voltage contact for operation, error display
Contact capacity: Below Max. AC240V 0.5A



■ Ventilating fan control from remote controller

[Function]

- The start/stop operation can be operated from the wired remote controller when air to air heat exchanger or ventilating fan is installed in the system.
- The fan can be operated even if the indoor unit is not operating.
- Use a fan which can receive the no-voltage A contact as an outside input signal.
- In a group control, the units are collectively operated and they can not be individually operated.

(1) Operation

Handle a wired remote controller in the following procedure.

∗ Use the wired remote controller during stop of the system.

∗ Be sure to set up the wired remote controller to the header unit. (Same in group control)

∗ In a group control, if the wired remote controller is set up to the header unit, both header and follower units are simultaneously operable.

1 Push concurrently SET + CL + TEST buttons for 4 seconds or more.

The unit No. displayed firstly indicates the header indoor unit address in the group control.

In this time, the fan of the selected indoor unit turns on.

2 Every pushing UNIT button, the indoor unit numbers in group control are displayed successively.

In this time, the fan of the selected indoor unit only turns on.

3 Using the setup temp ▼ or ▲ button, specify the item code 31.

4 Using the timer time ▼ or ▲ button, select the setup data. (At shipment: 0000)

The setup data are as follows:

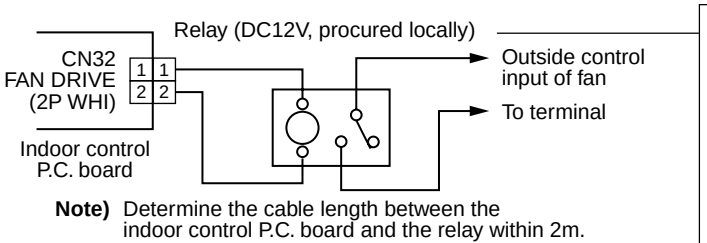
Setup data	Handling of operation of air to air heat exchanger or ventilating fan
0000	Unavailable (At shipment)
0001	Available

5 Push SET button. (OK if display goes on.)

- To change the selected indoor unit, go to the procedure **2**).
- To change the item to be set up, go to the procedure **3**).

6 Pushing TEST returns the status to the usual stop status.

(2) Wiring



Note) Determine the cable length between the indoor control P.C. board and the relay within 2m.

4-way Air Discharge Cassette type
1-way Air Discharge Cassette type (2 series)
Concealed Duct Standard type
Slim Duct type
Under Ceiling type
High Wall type
} model :

Corresponds up to a relay in which rated current of the operation coil is approx. 75mA

Other type models:

Correspond up to a relay in which rated current of the operation coil is approx. 16mA (Does not correspond to a terminal block type relay on the market.)

■ Leaving-ON prevention control

[Function]

- This function controls the indoor units individually. It is connected with cable to the control P.C. board of the indoor unit.
- In a group control, it is connected with cable to the indoor unit (Control P.C. board), and the item code 2E is set to the connected indoor unit.
- It is used when the start operation from outside if unnecessary but the stop operation is necessary.
- Using a card switch box, card lock, etc, the forgotten-OFF of the indoor unit can be protected.
  - When inserting a card, start/stop operation from the remote controller is allowed.
  - When taking out a card, the system stops if the indoor unit is operating and start/stop operation from the remote controller is forbidden.

(1) Control items

1) Outside contact ON : The start/stop operation from the remote controller is allowed.
(Status that card is inserted in the card switch box)

2) Outside contact OFF : If the indoor unit is operating, it is stopped forcedly.
(Start/Stop prohibited to remote controller)
(Status that card is taken out from the card switch box)

∗ When the card switch box does not perform the above contact operation, convert it using a relay with b contact.

(2) Operation

Handle the wired remote controller switch in the following procedure.

∗ Use the wired remote controller switch during stop of the system.

1 Push concurrently SET + CL + TEST buttons for 4 seconds or more.

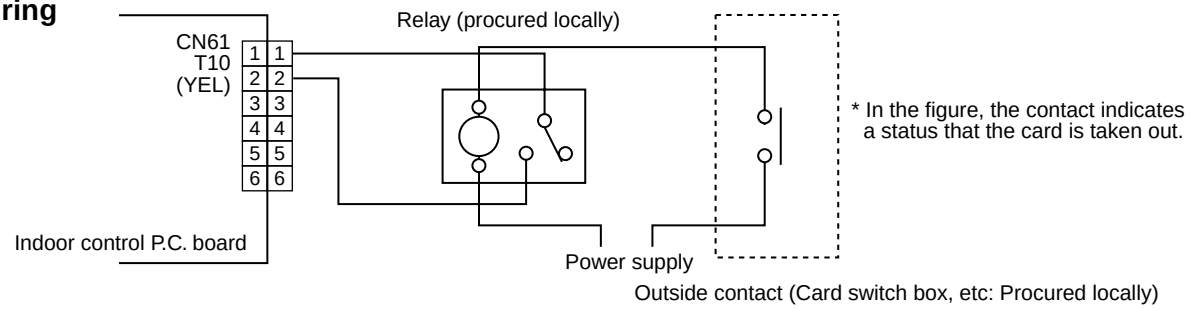
2 Using the setup temp ▼ or ▲ button, specify the item code 2E.

3 Using the timer time ▼ or ▲ button, set 0001 to the setup data.

4 Push SET button.

5 Push TEST button. (The status returns to the usual stop status.)

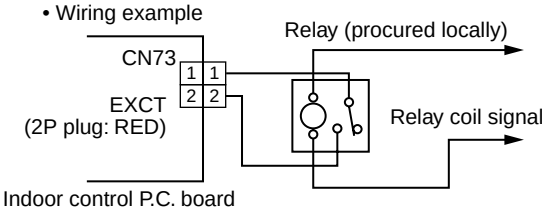
(3) Wiring



Note) Determine the cable length between the indoor control P.C. board and the relay within 2m.

■ Demand control from indoor unit

When the relay is turned on, a forced thermostat-OFF operation starts.



Note) Determine the cable length between the indoor or outdoor control P.C. board and the relay within 2m.

8. TROUBLESHOOTING

8-1. Troubleshooting Summary

1. Before troubleshooting

1) Applied models

Super Heat Recovery Multi type models

(Indoor unit: MMX-APXXX, Outdoor unit: MMY-MAPXXXFT8)

2) Required tools / measuring devices

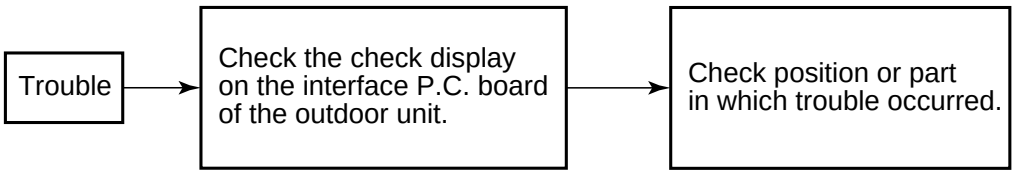
- Screwdrivers (Philips, Minus), spanner, radio pinchers, nipper, push pin for reset switch, etc.
- Tester, thermometer, pressure gauge, etc.

3) Confirmation before check (The following items are not troubles.)

No.	Operation	Check items
1	Compressor does not operate.	• Is not delayed for 3 minutes? (3 minutes after compressor-OFF) • Is not thermostat OFF? • Is not the fan operating or timer? • Is not the system initially communicating? Heating operation cannot be performed under condition of outside temperature 21°C or higher. Cooling operation cannot be performed under condition of outside temperature –5°C or lower.
2	Indoor fan does not work.	• Is not the cold draft prevention being controlled in heating operation?
3	Outdoor fan does not rotate, or fan speed changes.	• Is not low cooling operation being controlled? • Is not a defrost operation being performed?
4	Indoor fan does not stop.	• Is not after-heat elimination operation being controlled after heating operation?
5	Start/stop operation on remote controller is unavailable.	• Is not auxiliary unit or remote control being operated?
6	——	• Is connecting wire of indoor unit or remote controller correct?

2. Troubleshooting procedure

When a trouble occurred, advance the check operation in the following procedure.


Trouble
Check the check display on the interface P.C. board of the outdoor unit.
Check position or part in which trouble occurred.

NOTE) While a check operation is performed, a malfunction of the microprocessor may be caused due to condition of the power supply or the external noise. If there is any noise source, change wires of the remote controller and signal wires to shield wires.

8-2. Check Method

On the remote controller (Main remote controller, Central control remote controller) and the interface P.C. board of the outdoor unit, a check display LCD (Remote controller) or 7-segment display (on the outdoor interface P.C. board) to display the operation is provided. Therefore the operation status can be known. Using this self-diagnosis function, a trouble or position with trouble of the air conditioner can be found as shown in the table below.

Check code list

The following list shows each check code. Find the check contents from the list according to part to be checked.

- In case of check from indoor remote controller: See “Main remote controller display” in the list.
- In case of check from outdoor unit: See “Outdoor 7-segment display” in the list.
- In case of check from AI-NET central control remote controller: See “AI-NET central control display” in the list.
- In case of check from indoor unit with wireless remote controller: See “Sensor block display of receiving unit” in the list.

IPDU: Intelligent Power Drive Unit
○ : Lighting, ¤ : Flashing, ● : Goes off
ALT.: Flashing is alternately when there are two flashing LED.
SIM: Simultaneous flashing when there are two flashing LED

Check code				Wireless remote controller				Check code name	Judging device
Main remote controller display	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Sub code		Operation ⏻	Timer 🕘	Ready ☼	Flash		
E01	—	—	—	¤	●	●		Communication error between indoor and remote controller (Detected at remote controller side)	Remote controller
E02	—	—	—	¤	●	●		Sending error of remote controller	Remote controller
E03	—	—	97	¤	●	●		Communication error between indoor and remote controller (Detected at indoor side)	Indoor
E04	—	—	04	●	●	¤		Communication circuit error between indoor and outdoor (Detected at indoor side)	Indoor
E06	E06	No. of indoor units in which sensor has been normally received	04	●	●	¤		Decrease of No. of indoor units	I/F
—	E07	—	—	●	●	¤		Communication circuit error of indoor and outdoor (Detected at outdoor side)	I/F
E08	E08	Duplicated indoor addresses	96	¤	●	●		Duplicated indoor addresses	Indoor / I/F
E09	—	—	99	¤	●	●		Duplicated master remote controllers	Remote controller
E10	—	—	CF	¤	●	●		Communication error in indoor P.C. B ass'y	Indoor
E12	E12	01: Indoor/Outdoor communication 02: Communication between outdoor units	42	¤	●	●		Automatic address start error	I/F
E15	E15	—	42	●	●	¤		No indoor automatic address	I/F
E16	E16	00: Capacity over 01: No. of connected units	89	●	●	¤		No. of connected indoor units / Capacity over	I/F
E18	—	—	97, 99	¤	●	●		Communication error between indoor header and follower units	Indoor
E19	E19	00: No header unit 02: Two or more header units	96	●	●	¤		Outdoor header units quantity error	I/F
E20	E20	01: Outdoor of other line connected 02: Indoor of other line connected	42	●	●	¤		Other line connected during automatic address	I/F
E23	E23	—	15	●	●	¤		Sending error in communication between outdoor units	I/F
E25	E25	—	15	●	●	¤		Duplicated follower outdoor addresses	I/F
E26	E26	No. of outdoor units which received signal normally	15	●	●	¤		Decrease of No. of connected outdoor units	I/F
E28	E28	Detected outdoor unit number	d2	●	●	¤		Follower outdoor error	I/F
E31	E31	01: IPDU1 error 02: IPDU2 error 03: IPDU1, 2 error 04: Fan IPDU error 05: IPDU + Fan IPDU error 06: IPDU2 + Fan IPDU error 07: All IPDU error	CF	●	●	¤		IPDU communication error	I/F

Check code				Wireless remote controller				Check code name	Judging device
Main remote controller display	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Sub code		Operation	Timer	Ready	Flash		
F01	—	—	OF	¤	¤	●	ALT	Indoor TCJ sensor error	Indoor
F02	—	—	Od	¤	¤	●	ALT	Indoor TC2 sensor error	Indoor
F03	—	—	93	¤	¤	●	ALT	Indoor TC1 sensor error	Indoor
F04	F04	—	19	¤	¤	○	ALT	TD1 sensor error	I/F
F05	F05	—	A1	¤	¤	○	ALT	TD2 sensor error	I/F
F06	F06	—	18	¤	¤	○	ALT	TE1 sensor error	I/F
F07	F07	—	18	¤	¤	○	ALT	TL sensor error	I/F
F08	F08	—	1b	¤	¤	○	ALT	TO sensor error	I/F
F10	—	—	OC	¤	¤	●	ALT	Indoor TA sensor error	Indoor
F12	F12	01: TS1 02: TS2	A2	¤	¤	○	ALT	TS1, TS2 sensor error	I/F
F13	F13	01: Comp. 1 side 02: Comp. 2 side	43	¤	¤	○	ALT	TH sensor error	IPDU
F15	F15	—	18	¤	¤	○	ALT	Outdoor temp sensor misconnecting (TE, TL)	I/F
F16	F16	—	43	¤	¤	○	ALT	Outdoor pressure sensor misconnecting (Pd, Ps)	I/F
F23	F23	—	43	¤	¤	○	ALT	Ps sensor error	I/F
F24	F24	—	43	¤	¤	○	ALT	Pd sensor error	I/F
F29	—	—	12	¤	¤	●	SIM	Indoor other error	Indoor
F31	F31	—	1C	¤	¤	○	SIM	Outdoor EEPROM error	I/F
H01	H01	01: Comp. 1 side 02: Comp. 2 side	IF	●	¤	●		Compressor break down	IPDU
H02	H02	01: Comp. 1 side 02: Comp. 2 side	1d	●	¤	●		Magnet switch error Overcurrent relay operation Compressor error (lock)	MG-SW Overcurrent relay IPDU
H03	H03	01: Comp. 1 side 02: Comp. 2 side	17	●	¤	●		Current detect circuit system error	IPDU
H04	H04	—	44	●	¤	●		Comp 1 case thermo operation	I/F
H06	H06	—	20	●	¤	●		Low pressure protective operation	I/F
H07	H07	—	d7	●	¤	●		Oil level down detective protection	I/F
H08	H08	01: TK1 sensor error 02: TK2 sensor error 03: TK3 sensor error 04: TK4 sensor error	d4	●	¤	●		Oil level detective temp sensor error	I/F
H14	H14	—	44	●	¤	●		Comp 2 case thermo operation	I/F
H16	H16	01: TK1 oil circuit system error 02: TK2 oil circuit system error 03: TK3 oil circuit system error 04: TK4 oil circuit system error	d7	●	¤	●		Oil level detective circuit error Magnet switch error Overcurrent relay operation	I/F MG-SW Overcurrent relay
L03	L03	—	96	¤	●	¤	SIM	Duplicated indoor header units	Indoor
L04	L04	—	96	¤	○	¤	SIM	Duplicated outdoor line addresses	I/F
L05	L05	—	96	¤	●	¤	SIM	Duplicated indoor units with priority (Displayed on indoor unit with priority)	I/F
L06	L06	No. of indoor units with priority	96	¤	●	¤	SIM	Duplicated indoor units with priority (Displayed in unit other than indoor unit with priority)	I/F
L07	—	—	99	¤	●	¤	SIM	Group line in individual indoor unit	Indoor
L08	L08	—	99	¤	●	¤	SIM	Indoor group/Address unset	Indoor I/F
L09	—	—	46	¤	●	¤	SIM	Indoor capacity unset	Indoor
L10	L10	—	88	¤	○	¤	SIM	Outdoor capacity unset	I/F
L17	L17	—	46	¤	○	¤	SIM	Inconsistency error of outdoor units	I/F
L18	L18	—	8A	¤	¤	¤	SIM	FS unit error	FS unit
L20	—	—	98	¤	○	¤	SIM	Duplicated central control addresses	AI-NET Indoor
L28	L28	—	46	¤	○	¤	SIM	Over No. of connected outdoor units	I/F
L29	L29	01: IPDU1 error 02: IPDU2 error 03: IPDU3 error 04: Fan IPDU error 05: IPDU1 + Fan IPDU error 06: IPDU2 + Fan IPDU error 07: All IPDU error	CF	¤	○	¤	SIM	No. of IPDU error	I/F
L30	L30	Detected indoor address	b6	¤	○	¤	SIM	Auxiliary interlock in indoor unit	Indoor
—	L31	—	—		—			IC error	I/F

Check code				Wireless remote controller				Check code name	Judging device
Main remote controller display	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Auxiliary code		Operation	Timer	Ready	Flash		
P01	—	—	11	●	¤	¤	ALT	Indoor fan motor error	Indoor
P03	P03	—	1E	¤	●	¤	ALT	Discharge temp TD1 error	I/F
P04	P04	01: Comp. 1 side 02: Comp. 2 side	21	¤	●	¤	ALT	High-pressure SW detection error	IPDU
P05	P05	01: Phase-missing detection 02: Phase order error	AF	¤	●	¤	ALT	Phase-missing detection / Phase order error	I/F
P07	P07	01: Comp. 1 side 02: Comp. 2 side	1C	¤	●	¤	ALT	Heat sink overheat error	IPDU I/F
P10	P10	Detected indoor address	Ob	●	¤	¤	ALT	Indoor overflow error	Indoor
P12	—	—	11	●	¤	¤	ALT	Indoor fan motor error	Indoor
P13	P13	—	47	●	¤	¤	ALT	Outdoor liquid back detection error	I/F
P15	P15	01: TS condition 02: TD condition	AE	¤	●	¤	ALT	Gas leak detection	I/F
P17	P17	—	bb	¤	●	¤	ALT	Discharge temp TD2 error	I/F
P19	P19	Detected outdoor unit number	08	¤	●	¤	ALT	4-way valve inverse error	I/F
P20	P20	—	22	¤	●	¤	ALT	High-pressure protective operation	I/F
P22	P22	0 ⎵ : IGBT short 1 ⎵ : Fan motor position detective circuit error 3 ⎵ : Fan motor trouble C ⎵ : TH sensor temp. error (Heat sink overheat) D ⎵ : TH sensor error E ⎵ : Vdc output error	1A	¤	●	¤	ALT	Outdoor fan IPDU error	Fan IPDU
P26	P26	01: Comp. 1 side 02: Comp. 2 side	14	¤	●	¤	ALT	G-TR short protection error	IPDU
P29	P29	01: Comp. 1 side 02: Comp. 2 side	16	¤	●	¤	ALT	Comp position detective circuit system error	IPDU
P31	—	—	47	¤	●	¤	ALT	Other indoor unit error (Group follower unit error)	Indoor
—	—	—	b7	By alarm device			ALT	Error in indoor group	AI-NET
—	—	—	97	—				AI-NET communication system error	AI-NET
—	—	—	99	—				Duplicated network adaptors	AI-NET

Error detected by TCC-LINK central control device

Check code				Wireless remote controller				Check code name	Judging device
Central control device indication	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Auxiliary code		Operation	Timer	Ready	Flash		
C05	—	—	—	—				Sending error in TCC-LINK central control device	TCC-LINK
C06	—	—	—	—				Receiving error in TCC-LINK central control device	TCC-LINK
C12	—	—	—	—				Batch alarm of general-purpose equipment control interface	HA control interface I/F
P30	Differs according to error contents of unit with occurrence of alarm							Group control follower unit error	TCC-LINK
	—	—	(L20 is displayed.)					Duplicated central control addresses	

New check code

1. Difference between the TCC LINK and AI-NET check code

The displaying method of the check code changes in this model and after.

	AI-NET check code	TCC Link
Used characters	Hexadecimal notation, 2 digits	Alphabet + Decimal notation, 2 digits
Characteristics of code classification	Few classification of communication/ incorrect setup system	Many classification of communication/incorrect setup system
Block display	Indoor P.C. board, Outdoor P.C. board, Cycle, Communication	Communication/Incorrect setup (4 ways), Indoor protection, Outdoor protection, Sensor, Compressor protection, etc.

< Display in wired remote controller >

- [⚠] goes on.
- [UNIT No.] + Check code + Operation lamp (Green) flash

<Display on sensor part in wireless remote controller>

- Block display of combination of [⏻] [🕘] [❁]

<Display on 7-segment in outdoor unit>

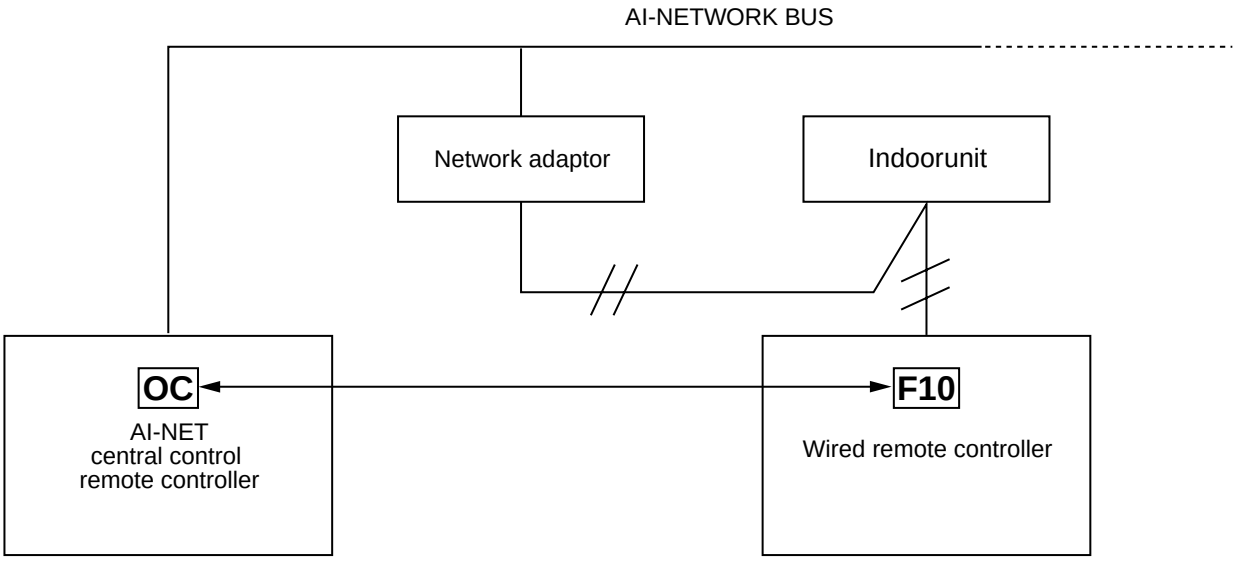
- Unit No. and check code are displayed.
- In a case of error with auxiliary code, the check code and the auxiliary code are displayed alternately.

Display	Classification
A	Unused
C	Central control system error
E	Communication system error
F	Each sensor error (Failure)
H	Compressor protective system error
J	Unused
L	Setup error, Other errors
P	Protective device operation

2. Special mention

1) If this model is connected to AI-NET by network adaptor, the different check codes are displayed on the main remote controller (New check code display on new remote controller) and AI-NET central control remote controller (AI-NET check code display on AI-NET central control remote controller).

   Example) Indoor TA sensor error



2) The check code of the remote controller is displayed only while the air conditioner is operating (Remote controller start button ON). When the air conditioner stopped and the error has been cleared, the check code display on the remote controller also disappears. However, if the error continues after stop of the operation, the check code is immediately displayed with restarting of the operation.

8-3. Troubleshooting by Check Display on Remote Controller

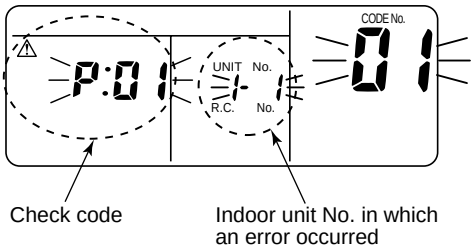
In case of wired remote controller (RBC-AMT31E)

1. Confirmation and check

When a trouble occurred on the air conditioner, the check code and the indoor unit No. are displayed on the display section of the remote controller.

The check code is displayed while the air conditioner operates.

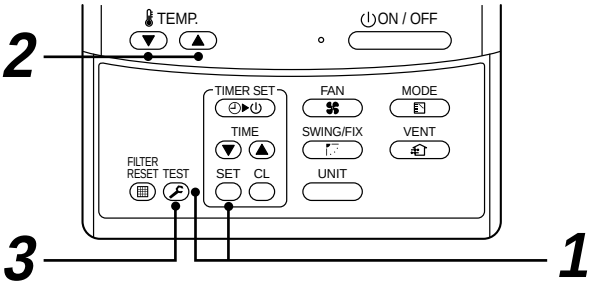
If the display disappeared, operate the air conditioner and check the error based upon the following “Confirmation of error history”.

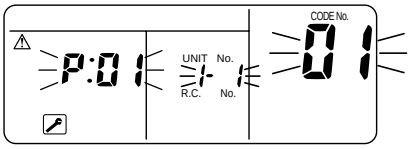


2. Confirmation of error history

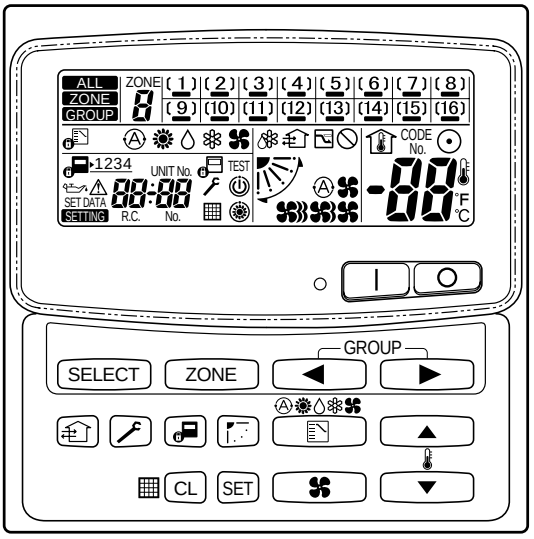
When a trouble occurred on the air conditioner, the error history can be confirmed with the following procedure.
(Up to 4 error histories are stored in memory.)

This history can be confirmed from either operating status or stop status.



Procedure	Description
1	When pushing SET and TEST buttons simultaneously for 4 seconds or more, the below display appears. If [Service Check] is displayed, the mode enters in the error history mode. • [01: Error history order] is displayed in code number window. • [Check Code] is displayed in check code window. • [Indoor unit address with error] is displayed in UNIT No. 
2	Every pushing temp. set ▼ / ▲ buttons, the error histories stored in the memory are displayed in order. The numbers in item code indicates item code [01] (Latest) to [04] (Oldest). **CAUTION** Do not push [CL] button because all the error histories of the indoor unit will be deleted.
3	After confirmation, push TEST button to return to the usual display.

In case of central remote controller (TCB-SC642TLE)

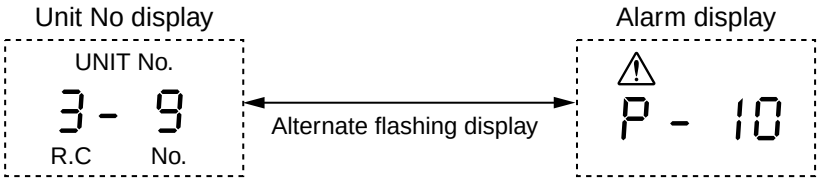


1. Confirmation and check

When a trouble occurred on the air conditioner, the check code and the indoor unit No. are displayed on the display section of the remote controller.

The check code is displayed while the air conditioner operates.

If the display disappeared, operate the air conditioner and check the error based upon the following “Confirmation of error history”.



2. Confirmation of error history

When a trouble occurred on the air conditioner, the error history can be confirmed with the following procedure. (Up to 4 error histories are stored in memory.)

This history can be confirmed from either operating or stop.

1) Push [🔧] and [SET] buttons in succession for 4 seconds or more.

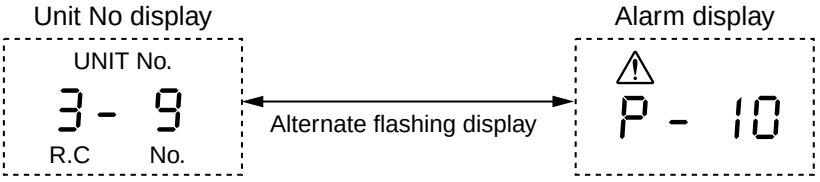
2) SERVICE CHECK [🔧] goes on and Item code 01 goes on.

3) When selecting (flash) the group number if there is the alarm history, the UNIT number and the latest alarm history are displayed alternately.
   * In this time, the temperature cannot be set up.

4) To confirm the alarm history other than the latest one, push temp. set [▲] / [▼] to select Item code (01 to 04).

5) To confirm the alarm in the other group, push [ZONE] and [GROUP ◀] [GROUP ▶] to select the group number
   Do not push [CL] button because all the alarm histories of the currently selected group are deleted.

6) To finish the service check, push [🔧] button.



8-4. Check Code and Check Position Displayed on the Remote Controller and Outdoor Unit (7-Segment Display of Interface)

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
E01	—	—	—	Remote controller	Communication error between indoor and remote controller (Detected at remote controller side)	Corresponding unit only stops.	Communication interrupted between indoor P.C. board and remote controller.	• Check remote controller inter-unit cable (A/B). • Check disconnection, connector contact error. • Check indoor power supply. • Check indoor P.C. board error. • Check remote controller address setup. (When two remote controllers operate) • Check remote controller P.C. board.
E02	—	—	—	Remote controller	Remote controller sending error	Corresponding unit only stops.	Signal could not be sent from remote controller to indoor unit.	• Check the communication wire of remote controller: Exchange remote controller.
E03	—	—	97	Indoor unit	Communication error between indoor and remote controller (Detected at indoor side)	Corresponding unit only stops.	No communication from remote controller (including wireless) and communication adapter.	• Check remote controller and communication adapter wiring.
E04	—	—	4	Indoor unit	Indoor/outdoor communication circuit error (Detected at indoor side)	Corresponding unit only stops.	Indoor unit does not receive communication from outdoor unit.	• Check power-ON order of indoor/outdoor. • Check indoor address setup. • Check inter-unit cabling between indoor and outdoor. • Check outdoor end terminal resistance setup (SW30-2).
E06	E06	No. of indoor units which received signal normally	4	I/F	Decreased number of indoor units	All stop	When signal is not sent for a certain period from the indoor unit which has been used to send signals, [E06] is normally displayed.	• Check the power supply of indoor unit. (Power-ON) • Check connection of communication line between indoor and outdoor. • Check connector connection for communication in indoor P.C. board. • Check connector connection for communication in outdoor P.C. board. • Check indoor P.C. board failure. • Check outdoor P.C. board (I/F) failure.
—	E07	—	—	I/F	Indoor/outdoor communication circuit error (Detected at outdoor side)	All stop	Transmission from outdoor to indoor cannot continue for 30 seconds.	• Check outdoor terminator resistor setup (SW30-2). • Check the communication connection between indoor and outdoor.
E08	E08	Duplicated indoor addresses	96	Indoor I/F	Duplicated indoor addresses	All stop	Multiple indoor unit address setup are duplicated.	• Check indoor address. • Check the change of remote controller connection (Group / individual) after setup of indoor address.
E09	—	—	99	Remote controller	Duplicated master remote controllers	Corresponding unit only stops.	In 2-remote controller control (including wireless), both are setup as master (Header indoor unit stops and other indoor unit is operating.)	• Check remote controller setup. • Check remote controller P.C. board.
E10	—	—	CF	Indoor unit	Communication error between indoor P.C. board assembly	Corresponding unit only stops.	There is any trouble in power line.	• Indoor P.C. board failure

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
E12	E12	01: Indoor/outdoor communication 02: Between outdoors communication	42	I/F	Automatic address start error	All stop	• When indoor automatic address started, other refrigerant circuit system was setting automatic address. • When outdoor automatic address started, indoor automatic address was executed.	• Setup the address again after disconnecting communication connection with other refrigerant circuit system.
E15	E15	—	42	I/F	No corresponding indoor unit during automatic address	All stop	Indoor unit is not found when indoor automatic address start was set up.	• Check the communication line connection between indoor and outdoor. • Check the electric power line error in indoor. • Check the noise of surrounding devices. • Power failure • Check indoor P.C. board error.
E16	E16	00: Capacity over 01 to: No. of connected units	89	I/F	No. of connected indoor units / Capacity over	All stop	• Total capacity of indoor units exceeded 135% of total outdoor capacity. • No. of connected indoor units are more than 48 units. **[Note]** If this code appears after backup setup of outdoor unit trouble, set up “No. capacity-over detection”. **<Setup method of “No. capacity-over detection”>** Turn on SW09/Bit 2 on I/F P.C. board of outdoor header unit.	• Check the connection capacity of indoor unit. • Check the HP capacity of indoor unit. • Check the indoor/outdoor capacity setup • Check the No. of connected indoor units. • Check the outdoor I/F P.C. board error
E18	—	—	97, 99	Indoor unit	Communication error between indoor header and follower units	Corresponding unit only stops.	Regular communication between indoor header and follower units	• Check cable of the remote controller. • Check power cabling of indoor. • Check P.C. board of indoor.
E19	E19	00: No header unit 02: Two or more header units	96	I/F	Outdoor unit quantity error	All stop	• There are multiple outdoor units in 1 line. • There is none of outdoor unit in 1 line.	The outdoor unit connected with communication cable between indoor and outdoor (U1.U2) is the outdoor unit. • Check connection of communication line between indoor and outdoor. • Check outdoor P.C. board(I/F) error.
E20	E20	01: Connection of outdoor of other line 02: Connection of indoor of other line	42	I/F	Other line unit connected during automatic address	All stop	Unit of other line was connected when indoor automatic address started.	Separate the cable between lines according to automatic address setup method in “Address setup”.
E23	E23	—	15	I/F	Communication sending error between outdoor units	All stop	Transmission of other outdoor unit was unavailable for 30 seconds or more.	In this model, only one outdoor unit is provided to one refrigerant line. Be sure to check there is no communication connection with outdoor unit in the other refrigerant line.
E25	E25	—	15	I/F	Duplicated outdoor follower address setup	All stop	Outdoor addresses manually set up are duplicated.	**Note)** Do not set up the outdoor address manually.
E26	E26	No. of normally received outdoor units	15	I/F	Decreased number of connected outdoor units	All stop	The signal was not returned for constant from the outdoor unit which was receiving signal.	In this model, only one outdoor unit is provided to one refrigerant line. Be sure to check there is no communication connection with outdoor unit in the other refrigerant line.
E28	E28	No. of detected outdoor units	d2	I/F	Outdoor follower unit error	All stop	Outdoor header unit received error code from outdoor follower unit.	• Check the check code of outdoor follower unit.

<Convenient functions>

When pushing SW04 for 1 second or more under condition that [E28] is displayed on 7-segment display of outdoor header unit, the fan of outdoor unit which stopped abnormally starts rotating.
If pushing SW04 and SW05 simultaneously, the fan of normal outdoor unit operates.
When pushing SW05 singly, the operation of fan is cleared.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
E31	E31	01: IPDU1 error 02: IPDU2 error 03: IPDU1, 2 errors 04: Fan IPDU error 05: IPDU1 + Fan IPDU error 06: IPDU2 + Fan IPDU error 07: All IPDU error or communication error between IPDU and I/F P.C. board or outdoor I/F P.C. board error	CF	I/F	IPDU communication error	All stop	Communication of each IPDU (P.C. board) in inverter box interrupted.	• Check connection of communication connector and disconnection between IPDU and I/F P.C. board. • Check outdoor P.C. board (I/F, IPDU, Fan IPDU) error. • Check external noise. • Check power supply P.C. board for fan error.
F01	—	—	OF	Indoor unit	Indoor TCJ sensor error	Corresponding unit only stops	• Resistance value of sensor is infinite or zero. (Open/Short)	• Check connection/cabling of TCJ sensor connector. • Check characteristics of TCJ sensor resistance value. • Check indoor P.C. board error.
F02	—	—	Od	Indoor unit	Indoor TC2 sensor error	Corresponding unit only stops.	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection/cabling of TC2 sensor connector. • Check characteristics of TC2 sensor resistance value. • Check indoor P.C. board error.
F03	—	—	93	Indoor unit	Indoor TC1 sensor error	Corresponding unit only stops.	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection/cabling of TC1 sensor connector. • Check characteristics of TC1 sensor resistance value. • Check indoor P.C. board error.
F04	F04	—	19	I/F	TD1 sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short)	• Check connection of TD1 sensor connector. • Check characteristics of TD1 sensor resistance value. • Check outdoor P.C. board (I/F) error.
F05	F05	—	A1	I/F	TD2 sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short)	• Check connection of TD2 sensor connector. • Check characteristics of TD2 sensor resistance value. • Check outdoor P.C. board (I/F) error.
F06	F06	—	18	I/F	TE1 sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection of TE1 sensor connector. • Check characteristics of TE1 sensor resistance value. • Check outdoor P.C. board (I/F) error.
F07	F07	—	18	I/F	TL sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection of TL sensor connector. • Check characteristics of TL sensor resistance value. • Check outdoor P.C. board (I/F) error.
F08	F08	—	1b	I/F	TO sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection of TO sensor connector. • Check characteristics of TO sensor resistance value. • Check outdoor P.C. board (I/F) error.
F10	—	—	OC	Indoor	Indoor TA sensor error	Corresponding unit only stops.	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection/cabling of TA sensor connector. • Check characteristics of TA sensor resistance value. • Check indoor P.C. board error.
F12	F12	01: TS1 02: TS2	A2	I/F	TS1, TS2 sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection of TS1 or TS2 sensor connector. • Check characteristics of TS1, TS2 sensor resistance value. • Check outdoor P.C. board (I/F) error.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
F13	F13	01: Compressor 1 side 02: Compressor 2 side	43	IPDU	TH sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short).	• IGBT built-in temp sensor error → Exchange IPDU P.C. board.
F15	F15	—	18	I/F	Outdoor temp sensor miscabling (TE1, TL)	All stop	During operation of compressor in HEAT mode, the TE1 detection temp was higher than that of TL by the specified value continued for 3 minutes or more.	• Check installation of TE1 sensor and TL sensor. • Check characteristics of TE1 and TL sensor resistance value. • Check outdoor P.C. board (I/F) error.
F16	F16	—	43	I/F	Outdoor pressure sensor miscabling (Pd, Ps)	All stop	High-pressure Pd sensor and low-pressure Ps sensor were exchanged, or output voltages of both sensors are zero.	• Check connection of high-pressure Pd sensor connector. • Check connection of low-pressure Ps sensor connector. • Check pressure sensors Pd and Ps error. • Check outdoor P.C. board (I/F) error. • Check compression error of compressor.
F23	F23	—	43	I/F	Ps sensor error	All stop	Output voltage of Ps sensor was zero.	• Misconnection of Ps sensor and Pd sensor connectors • Check connection of Ps sensor connector. • Check Ps sensor error. • Check compression error of compressor. • Check 4-way valve error. • Check outdoor P.C. board (I/F) error. • Check SV4 circuit error.
F24	F24	—	43	I/F	Pd sensor error	All stop	Output voltage of Pd sensor was zero. (Sensor Open) Pd > 4.15MPa during stop of compressor	• Check connection of Pd sensor connector. • Check Pd sensor error. • Check outdoor P.C. board (I/F) error.
F29	—	—	12	Indoor	Indoor other error	Corresponding unit only stops.	Indoor P.C. board did not operate normally.	• Check indoor P.C. board error (EEPROM error).
F31	F31	—	1C	I/F	Outdoor EEPROM error	All stop (*1)	Outdoor P.C. board (I/F) did not operate normally.	• Check power voltage. • Check power noise. • Check outdoor P.C. board (I/F) error.
H01	H01	01: Compressor 1 side 02: Compressor 2 side	1F	IPDU	Compressor breakdown	All stop	Inverter current detection circuit detected over-current and stopped.	• Check power voltage. (AC220–240V ± 10%). • Check compressor error. • Check cause of abnormal overload operation. • Check outdoor P.C. board (IPDU) error.
H02	H02	01: Compressor 1 side 02: Compressor 2 side	1d	IPDU	Compressor error (lock) MG-SW error OCR operation	All stop	Over-current was detected several seconds after header compressor had started.	• Check compressor error. • Check power voltage. (AC380–10%, 415V +10%). • Check cable of compressor and phase-missing. • Check connector/terminal connection on IPDU P.C. board. • Check conduction of case heater. (Check activation error due to liquid stagnation in compressor.) • Check outdoor P.C. board (IPDU) error. • Check outdoor MG-SW or OCR.

(*1) All stop only in case of the header unit The follower unit continues operation.

MG-SW : Magnet Switch, OCR : Over-current Relay

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
H03	H03	01: Compressor 1 side 02: Compressor 2 side	17	IPDU	Current detection circuit system error	All stop	While header compressor stopped, current flowed more than the specified current and was detected.	• Check cabling of current detection circuit system. • Check outdoor P.C. board (IPDU) error.
H04	H04	—	44	I/F	Compressor 1 case thermo operation	All stop	Compressor 1 case thermostat performed protective operation.	• Check compressor 1 case thermo circuit. (Connector, cable, P.C. board) • Check full opening of service valve. (Gas and liquid side) • Check outdoor PMV clogging. (PMV1, 2, 3) • Check SV41 circuit leakage. • Check miscabling/misinstallation of SV41 and SV42. • Check valve open status of indoor PMV. • Check 4-way valve error. • Check refrigerant shortage. • Check SV5 leak. • Check SV11 circuit. (Wiring, OFF at one side only) • Check mispiping of discharge gas/suction gas main pipe. • Check Flow selector unit. Check leakage of SVD valve and SVS valve. (Check leakage of SVDD valve and SVSS.) Check mispiping of FS unit connecting pipe (Suction gas/Discharge gas), wiring between FS unit and indoor unit, and connection of connectors. Check miswiring of SVS/SVD valves.
H06	H06	—	20	I/F	Low-pressure protective operation	All stop	Low-pressure Ps detected operation lower than 0.02MPa.	• Check full opening of service valve. (Discharge gas, suction gas and liquid side) • Check outdoor PMV clogging. (PMV1, 2) • Check SV2 circuit and SV4 circuit error. • Check low-pressure Ps sensor error. • Check indoor air filter clogging. • Check valve open of indoor PMV. • Check refrigerant pipe clogging. • Check outdoor fan operation. (All heating, mainly heating, part cooling operation) • Check refrigerant shortage. • Check clogging of circuit at auxiliary heat exchanger side. (PMV3, SV12, check valve) • Check 4-way valve error. (Reversal error) • Check mispiping of discharge gas/suction gas main pipe. • Check Flow selector unit. Check miswiring of discharge gas/suction gas pipe to FS unit. Check wiring between FS unit and indoor unit. Check miswiring of SVD/SVS valves, misinstallation of coil. Check opened status of SVS valve.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
H07	H07	—	d7	I/F	Protection for oil level drop detection	All stop	The operating compressor detected oil shortage continuously for 2 hours.	**<Check all the outdoor units in the corresponding line.>** • Check full opening of service valve of balance pipe. • Check connection and installation of TK1, TK2, TK3, and TK4 sensors. • Check characteristics of TK1, TK2, TK3, and TK4 resistance values. • Check gas leak and oil leak in the same line. • Check refrigerant stagnation in compressor. • Check error of SV3A, SV3B, SV3C, SV3D, and SV3E valves. • Check clogging of oil separator oil return circuit. • Check clogging of oil-equation circuit. <Check clogging of oil equation pipe between compressors.> • Check TS1, TS2 sensors (Miswiring and misinstallation of TS1 and TS2) • Check leakage of SV6 circuit. • Check FS unit. Leakage of check valve of bypass between liquid pipe and discharge gas pipe Mispiping of discharge/suction gas connection Miswiring of SVD/SVS valve/Misinstallation of coil • Check whether there is no setup missing of indoor unit in all cooling operation mode
H08	H08	01: TK1 sensor error 02: TK2 sensor error 03: TK3 sensor error 04: TK4 sensor error	d4	I/F	Oil level detective temp sensor error	All stop	• Resistance value of sensor is infinite or zero. (Open/Short)	• Check connection of TK1 sensor connector. • Check characteristics of TK1 sensor resistance value. • Check outdoor P.C. board (I/F) error.
						All stop	• Resistance value of sensor is infinite or zero. (Open/Short)	• Check connection of TK2 sensor connector. • Check characteristics of TK2 sensor resistance value. • Check outdoor P.C. board (I/F) error.
						All stop	• Resistance value of sensor is infinite or zero. (Open/Short)	• Check connection of TK3 sensor connector. • Check characteristics of TK3 sensor resistance value. • Check outdoor P.C. board (I/F) error.
						All stop	• Resistance value of sensor is infinite or zero. (Open/Short)	• Check connection of TK4 sensor connector. • Check characteristics of TK4 sensor resistance value. • Check outdoor P.C. board (I/F) error.
H14	H14	—	44	I/F	Compressor 2 case thermo operation	All stop	Compressor 2 case thermostat operated.	• Check compressor 2 case thermo circuit. (Connector, cable, P.C. board) • Check full opening of service valve. (Gas and liquid side) • Check outdoor PMV clogging. (PMV1, 2) • Check SV42 valve leak. • Check miscabling/misinstallation of SV41 and SV42. • Check valve opening of indoor PMV. • Check 4-way valve error. • Check refrigerant shortage. • Check SV11 circuit. (Wiring, OFF at one side only) • Check mispiping of discharge gas/suction gas main pipe. • Check Flow selector unit. Check leakage of SVD valve and SVS valve. (Check leakage of SVDD valve and SVSS.) Check mispiping of FS unit connecting pipe (Suction gas/Discharge gas), wiring between FS unit and indoor unit, and connection of connectors. Check miswiring of SVS/SVD valves.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
H16	H16	01: TK1 oil circuit system error 02: TK2 oil circuit system error 03: TK3 oil circuit system error 04: TK4 oil circuit system error	d7	I/F	Oil level detective circuit system error MG-SW error OCR operation	All stop	Temperature change of TK1 could not be detected though compressor 1 started the operation.	• Check TK1 sensor coming-off. • Check characteristics of TK1 sensor resistance value. • Check TK1, TK2, TK3, and TK4 misconnection. • Check operation error of SV3E valve. • Check capillary clogging of oil-equation circuit and operation error of stop valve. • Check refrigerant stagnation in compressor. • Check MG-SW or OCR.
							Temperature change of TK2 could not be detected though compressor 2 started the operation.	• Check TK2 sensor coming-off. • Check characteristics of TK2 sensor resistance value. • Check TK1, TK2, TK3, and TK4 misconnection. • Check SV3E valve operation. • Check capillary clogging of oil equalization circuit and check stop valve operation. • Check refrigerant stagnation in compressor shell. • Check MG-SW or OCR.
							Temperature change of TK3 could not be detected though compressor started the operation.	• Check TK3 sensor coming-off. • Check characteristics of TK3 sensor resistance value. • Check TK1, TK2, TK3, and TK4 misconnection. • Check SV3E valve operation. • Check capillary clogging of oil-equalization circuit and check valve operation. • Check refrigerant stagnation in compressor shell. • Check MG-SW or OCR.
							Temperature change of TK4 could not be detected though compressor started the operation, or the difference from other TK sensor changed for a constant time only within the specified range.	• Check TK4 sensor coming-off. • Check characteristics of TK4 sensor resistance value. • Check TK1, TK2, TK3, and TK4 misconnection. • Check SV3E valve operation. • Check capillary clogging of oil-equalization circuit and check valve operation. • Check refrigerant stagnation in compressor shell. • Check MG-SW or OCR.
L03	—	—	96	Indoor	Duplicated indoor center units	Corresponding unit only stops.	There are multiple center units in a group.	• Check indoor address. • Check the change of remote controller connection (Group/individual) after indoor address setup.
L04	L04	—	96	I/F	Duplicated outdoor line address	All stop	Line address setup is duplicated against the outdoor unit in different refrigerant pipe system.	• Check line address.
L05	—	—	96	I/F	Duplicated indoor units with priority (Displayed on indoor unit with priority)	All stop	Indoor units with priority were duplicated.	• Check display of indoor unit with priority.

MG-SW : Magnet Switch, OCR : Over-current Relay

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
L06	L06	No. of indoor units with priority	96	I/F	Duplicated indoor units with priority (Displayed on the unit other than indoor unit with priority)	All stop	Indoor units with priority were duplicated.	• Check display of indoor unit with priority and outdoor unit.
L07	—	—	99	Indoor	Group line in individual indoor unit.	Corresponding unit only stops.	At least one indoor unit connected to a group existed in the individual indoor units.	• Check indoor address.
L08	L08	—	99	Indoor	Indoor group / address unset	Corresponding unit only stops.	Address was not yet set up.	• Check indoor address. **Note)** After installation, this code is displayed when the power is firstly turned on.
L09	—	—	46	Indoor	Indoor capacity unset	Corresponding unit only stops.	Indoor unit capacity was unset.	Set up indoor capacity. (DN=11)
L10	L10	—	88	I/F	Outdoor capacity unset	All stop	On the I/F P.C. board for service, jumper line was not cut according to the model.	Check model setup on outdoor I/F P.C. board A'ssy for service.
L17	L17	—		I/F	Inconsistent models of outdoor units		Outdoor units of 1 series and those of 2 series were mixed.	• Check outdoor units.
L18	L18	Corresponding indoor address	8A	I/F	FS unit system error	Corresponding unit only stops.	An indoor unit which is not connected with FS unit is driving without setup for cooling only mode.	• Check setup of remote controller (DN=[OFF]). • Check FS unit. Check pipe connection to FS unit. (Mispiping between discharge gas and suction gas) Check miswiring/misinstallation of SVS/SVD valves.
L20	—	—	98	AI-NET, Indoor	Duplicated central control addresses	All stop	Duplicated central control addresses	• Check central control address. • Check network adaptor P.C. board. (In case of AI-NET)
L28	L28	—	46	I/F	Quantity over of connected outdoor units	All stop	There were more than four outdoor units.	• Check No. of connected outdoor units. (Max. 4 units per 1 system) • Check communication line between outdoor units. • Check outdoor P.C. board (I/F) error.
L29	L29	01: IPDU1 error 02: IPDU2 error 03: IPDU1, 2 errors 04: Fan IPDU error 05: IPDU1 + Fan IPDU error 06: IPDU2 + Fan IPDU error 07: All IPDU error or communication error between IPDU and I/F P.C. board, or outdoor I/F P.C. board error	CF	I/F	IPDU quantity error	All stop	No. of IPDU units detected when power was turned on were less.	• Check model setup for outdoor I/F service P.C. board. • Check connection of UART communication connector. • Check IPDU, fan IPDU, and I/F P.C. board error. **Note)** UART: Universal Asynchronous Receiver Transmitter
L30	L30	Detected indoor address	b6	Indoor	Interlock in indoor unit from outside	Corresponding unit only stops.	• Outside error input terminal Detected signal to (CN80) for more 1 minute	■ Outside device is connected to connector (CN80): 1) Check outside device error. 2) Check indoor P.C. board error. ■ Outside device is not connected to connector (CN80): 1) Check indoor P.C. board error.
—	L31	—	—	I/F	Extended IC (Integrated Circuit) error	Operation continues.	P.C. board (I/F) parts error	Check indoor (I/F) P.C. board.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
P01	—	—	11	Indoor	Indoor fan motor error	Corresponding unit only stops.		• Check the lock of fan motor (AC fan). • Check cabling.
P03	P03	—	1E	I/F	Discharge temp TD1 error	All stop	Discharge temp (TD1) exceeded 115°C.	• Check full opening of outdoor service valves (Gas side, Liquid side). • Check clogging of outdoor PMV. (PMV1,2) • Check characteristics of TD1 sensor resistance value. • Check refrigerant shortage. • Check 4-way valve error. • Check leakage of SV41 circuit. • Check SV4 circuit. (Miswiring and misinstallation of SV41 and SV42) • Check leakage of SV5 circuit. • Check leakage of SV6 circuit. (Capillary clogging, valve operation error) • Check mispiping of discharge gas/suction gas main pipe. • Check Flow selector unit. Check leakage of SVD valve and SVS valve. (Check leakage of SVDD valve and SVSS.) Check mispiping of FS unit connecting pipe (Suction gas/Discharge gas), wiring between FS unit and indoor unit, and connection of connectors. Check miswiring of SVS/SVD valves.
P04	P04	01: Compressor 1 side 02: Compressor 2 side	21	I/F	Actuation of high-pressure SW	All stop	High-pressure SW actuated.	• Check Pd pressure sensor error. • Check full opening of outdoor service valves (Gas side, Liquid side). • Check outdoor fan error. • Check outdoor fan motor error. • Check clogging of outdoor PMV. (PMV1,2) • Check clogging of indoor/outdoor heat exchangers. • Check short-circuiting of outdoor suction/discharge air. • Check clogging of SV2 circuit. • Check outdoor P.C. board (I/F) error. • Check indoor fan system error. (Cause of air volume decrease) • Check opening of indoor PMV. • Check miscabling of communication line between indoor and outdoor. • Check operation error of check valve of discharge pipe. • Check SV4 valve circuit. • Check SV5 valve circuit. • Check refrigerant overcharge. • Check mispiping of discharge gas/suction gas main pipe. • Check circuit clogging at auxiliary heat exchanger side. (PMV3, SV12, check valve) • Check FS unit. Check clogging of SVD valve and operation error. Check wiring inside of FS unit. (SVD/SVS coil miswiring, etc.) Check wiring between FS unit and indoor unit. (Miswiring, Disconnection, Wiring missing)
P05	P05	01: Power supply open phase 02: Power supply negative phase	AF	I/F	Open phase negative phase	All stop	• Open phase was detected when the power turned on. • Negative phase was detected when the power turned on.	• Check outdoor power line. • Check outdoor P.C. board (I/F) error.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
P07	P07	01: Compressor 1 side 02: Compressor 2 side	1C	IPDU I/F	Heat sink overheat error	All stop	IGBT built-in temp sensor (TH) was overheated.	• Check power voltage. • Check outdoor fan system error. • Check clogging of heat sink cooling duct. • Check fixation between IGBT and heat sink. (Check screwing and contact.) • Check IPDU error.(IGBT built-in temp sensor (TH) error).
P10	P10	Indoor address with trouble	Ob	Indoor	Indoor overflow error	All stop	• Float switch operated. • Float switch circuit disconnected or the connector came off.	• Check the float switch connector. • Check operation of drain pump unit. • Check the drain pump circuit. • Check clogging of drain pipe. • Check indoor P.C. board error.
P12	—	—	11	Indoor	Indoor fan motor error	Corresponding unit only stops.	• The value of motor speed deviated from target value was detected for certain time. • Over-current protection operated.	• Check connection of fan connector and wiring. • Check fan motor error. • Check indoor P.C. board error. • Check influence of outside air control. • Check indoor type code (DN=10) and the capacity code (DN=11).
P13	P13	—	47	I/F	Outdoor liquid back detection error	All stop	**<In heating>** While the system is operating in HEAT mode, outdoor PMV of which opening degree was 100 pulse or less for a certain time.	• Check full close operation of outdoor PMV (1, 2). • Check Pd and Ps sensor error. • Check clogging of SV2 circuit. • Check clogging of 4-way valve error circuit. • Check outdoor P.C. board (I/F) error. • Check capillary clogging of oil return circuit from oil separator. • Check TS1, TS2 sensor error.
P15	P15	01: TS condition	AE	I/F	Gas leak detection (TS1 condition)	All stop	Suction temp exceeded the judgment standard temp for 10 minutes or more. **<TS error judgment standard temperature>** In cooling operation: 60°C or higher In heating operation: 40°C or higher	• Check refrigerant shortage. • Check full open of outdoor service valves (gas side, liquid side). • Check outdoor PMV clogging (PMV1, 2). • Check characteristics of TS1 sensor resistance value. • Check 4-way valve error. • Check leakage of SV4 circuit. • Check leakage of SV5 circuit. • Check mispiping of discharge gas/suction gas main pipe. • Check Flow selector unit. Check leakage of SVD valve and SVS valve. (Check leakage of SVDD valve and SVSS.) Check mispiping of FS unit connecting pipe (Suction gas/Discharge gas), wiring between FS unit and indoor unit, and connection of connectors. Check miswiring of SVS/SVD valves.
		02: TD condition	AE	I/F	Gas leak detection (TD condition)	All stop	Discharge temperature TD1 or TD2 was continuously 108°C or higher for 10 minutes.	• Check refrigerant shortage. • Check outdoor PMV clogging (PMV1, 2). • Check characteristics of TD1, TD2 sensor resistance value. • Check indoor air filter clogging. • Check pipe clogging. • Check SV4 circuit (Valve leakage, misinstallation) • Check mispiping of discharge gas/suction gas main pipe. • Check Flow selector unit. Check leakage of SVD valve and SVS valve. (Check leakage of SVDD valve and SVSS.) Check mispiping of FS unit connecting pipe (Suction gas/Discharge gas), wiring between FS unit and indoor unit, and connection of connectors. Check miswiring of SVS/SVD valves.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
P17	P17	—	bb	I/F	Discharge temp TD2 error	All stop	Discharge temperature (TD2) exceeded 115°C.	• Check full opening of outdoor service valves (gas side, liquid side). • Check clogging of outdoor PMV (PMV1, 2). • Check characteristics of TD2 sensor resistance value. • Check 4-way valve error. • Check leakage of SV42 circuit. • Check SV4 circuit. (Miscabling and misinstallation of SV41 and SV42) • Check leakage of SV5 valve circuit. • Check SV6 circuit. (Clogging, Valve operation error) • Check mispiping of discharge gas/suction gas main pipe. • Check Flow selector unit. Check leakage of SVD valve and SVS valve. (Check leakage of SVDD valve and SVSS.) Check mispiping of FS unit connecting pipe (Suction gas/Discharge gas), wiring between FS unit and indoor unit, and connection of connectors. Check miswiring of SVS/SVD valves.
P19	P19	Detected outdoor unit No.	8	I/F	4-way valve operation error	All stop	When abnormal refrigerating cycle data was detected in heating	• Error of 4-way valve error • Check coil error and connector connection of 4-way valve. • Check characteristics of TS1/TE1 sensor resistance value. • Check characteristics of Pd, Ps pressure sensor output voltage. • Check misconnection of TE1 and TL sensors. • Check Flow selector unit. Check leakage of SVD valve and SVS valve. (Check leakage of SVDD valve and SVSS.) Check mispiping of FS unit connecting pipe (Suction gas/Discharge gas).
P20	P20	—	22	I/F	High-pressure protective operation	All stop	Pd sensor detected 3.6MPa or more.	• Check Pd pressure sensor error. • Check full opening of service valves (Gas side, Liquid side). • Check outdoor fan error. • Check outdoor fan motor error. • Check clogging of outdoor PMV. (PMV1,2) • Check clogging of indoor/outdoor heat exchangers. • Check air short-circuiting in outdoor unit. • Check clogging of SV2 circuit. • Check outdoor P.C. board (I/F) error. • Check indoor fan system error. (Cause of air volume decrease) • Check valve opening of indoor PMV. • Check miscabling of communication line between indoor and outdoor. • Check operation error of check valve of discharge pipe. • Check circuit of gas balance SV4 valve. • Check mispiping of discharge gas/suction gas main pipe. • Check operation error of check valve of discharge gas pipe. • Check circuit of SV11 valve. (Clogging, OFF at one side only) • Check clogging of circuit at auxiliary heat exchanger side. (Miswiring, Disconnection, Wiring missing) • Check Flow selector unit. Check leakage of SVD valve and operation error. Check wiring inside of FS unit. (SVD/SVS coil miswiring, etc.) Check wiring between FS unit and indoor unit. (Miswiring, Disconnection, Wiring missing) • Check circuit of SV5 valve. • Check refrigerant overcharge.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
P22	P22	0: IGBT shortage 1: Position detection circuit error 3: Motor lock error 4: Motor current error detection C: TH sensor temp. error D: TH sensor error E: Vdc error	1A	FAN-IPDU	Outdoor fan IPDU error	All stop	**(Sub-code: 0)** • Short-circuit current was detected at start time. • Short-circuit current was detected when checking IGBT short-circuit before start time.	• Check fan motor. (Interphase short-circuit) • Check fan IPDU error.
						All stop	**(Sub-code: 1)** • The standard value of detection circuit of fan IPDU current fluctuated at start time.	• Check fan IPDU error.
						All stop	**(Sub-code: 3)** • Abnormal current was detected within 30 seconds after start time.	• Check fan motor. (Lock, phase missing) • Check cause of abnormal overload at start time. • Check connection of connector to fan motor.
						All stop	**(Sub-code: 4)** • Short-circuit current was detected when 2 seconds or more passed after start time. • Over-current was detected when 30 seconds or more passed after start time.	• Check power supply voltage. • Check fan IPDU error.
						All stop	**(Sub-code: C)** • Heat sink sensor (TH) of fan IPDU detected 95°C error.	• Check outdoor fan system. • Check fan IPDU error. • Check fixation between fan IPDU and heat sink.
						All stop	**(Sub-code: D)** • Heat sink sensor (TH) of fan IPDU detected short-circuiting or open.	• Check fan IPDU error.
						All stop	**(Sub-code: E)** • Input power supply voltage of the fan IPDU over the setup value was detected. • Input power supply terminal of the fan IPDU was unconnected. • Power supply P.C. board error of the fan IPDU	• Check input power supply voltage of the fan IPDU. • Check power supply P.C. board error of the fan IPDU. • Check error of external electrolytic condenser.
P26	P26	01: Compressor 1 side 02: Compressor 2 side	14	IPDU	G-Tr short-circuit protection error	All stop	Instantaneous over-current was detected when compressor started.	• Check connector connection and wiring on IPDU P.C. board. • Check compressor error and defect of compressor coil. • Check outdoor P.C. board (IPDU) error.
P29	P29	01: Compressor 1 side 02: Compressor 2 side	16	IPDU	Compressor position detection circuit error	All stop	Position was not normally detected.	• Check connector connection and wiring. • Check compressor error and defect of compressor coil. • Check P.C. board (IPDU) error.
P31	—	—	47	Indoor	Other indoor error (Group follower unit error)	Corresponding unit only stops.	E07/L07/L03/L08 was detected when other indoor unit in the group was defective.	• Check indoor P.C. board.

Error detected by TCC-LINK central control device

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Display on central control device	Outdoor 7-segment display		AI-NET central control remote controller					
		Sub-code						
C05	—		—	TCC-LINK	TCC-LINK central control device transmission error	Operation continued.	Signal is not transmit from central control device.	• Check central control device error. • Check communication line error of central control device. • Check setup of terminator resistor.
C06	—		—		TCC-LINK central control device receiving error	Operation continued.	Signal is not received from central control device.	• Check central control device error. • Check communication line error of central control device. • Check setup of terminator resistor. • Check the power of connecting destination connected device. • Check P.C. board error of the connected device.
C12	—		—	HA control interface	Interface batch alarm of HA control interface	Operation continued.	Error was input in HA control interface	• Check error input.
P30	Differs according to error contents of the with alarm			TCC-LINK	Follower unit error of group control	Operation continued.	An error occurred in follower unit of the group control. ([P30] is displayed only on the central remote controller.)	• Check the check code of the unit with alarm.
	(L20 is displayed.)				Duplicated central control address	Operation continued.	Central control addresses were duplicated.	• Check the address setup.

Error detected by AI-NET central control device

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
—	—	—	97	AI-NET	AI-NET communication system error	Operation continued.	E07/L07/L03/L08 was detected when other indoor unit in the group was defective.	• Check multiple network adapters. • Check wire and miscabling of remote controller: Only one network adapter can be connected to communication line of remote controller.
—	—	—	99	AI-NET	Duplicated network adapters	Operation continued.	Multiple network adapters were connected to communication line of remote controller. (Detected at central controller side)	• Check communication line, miscabling, and power of indoor unit. • Check communication. (X, Y terminals) • Check network adapter P.C. board. • Check the central controller (Central control remote controller, etc.)
—	—	—	b7	AI-NET	Error in indoor group	Operation continued.	Error of follower unit in the group	• Check follower unit in the group.

* These errors are concerned to communication of remote controllers (A, B) and central system [AI-NET X, Y], and the main remote controller displays [E01], [E02], [E03], [E09], or [E18] in some cases and displays none in other cases according to the contents.

Cautions when servicing for compressor

1. Removing wires of both compressors check output of the inverter as described below.

How to check inverter output

1. Turn off the power supply.
2. Remove the compressor lead cables from the compressors.
   (Be sure to remove lead cables of both compressors.)
3. Turn on the power supply and start cooling or heating operation.
   In this time, pay attention to touch the fasten receptacle terminal lug of the compressor leads so that they do not contact with other fasten receptacle terminal lug or other position (unit cabinet, etc.).
4. Check output voltage of compressor lead cable at inverter side.
   When the output voltage does not satisfy the criteria in the following table, replace IPDU P.C. board.

No.	Measured position	Criteria
1	Between Red and White	400 V to 650 V
2	Between White and Black	400 V to 650 V
3	Between Black and Red	400 V to 650 V

* After checking the output, when connecting the compressor lead again to the compressor terminal, check surely there is no distortion on the fasten terminal lug. If it is loosened, caulk it with pinchers, etc and then connect lead to the terminal.

How to check resistance of compressor winding

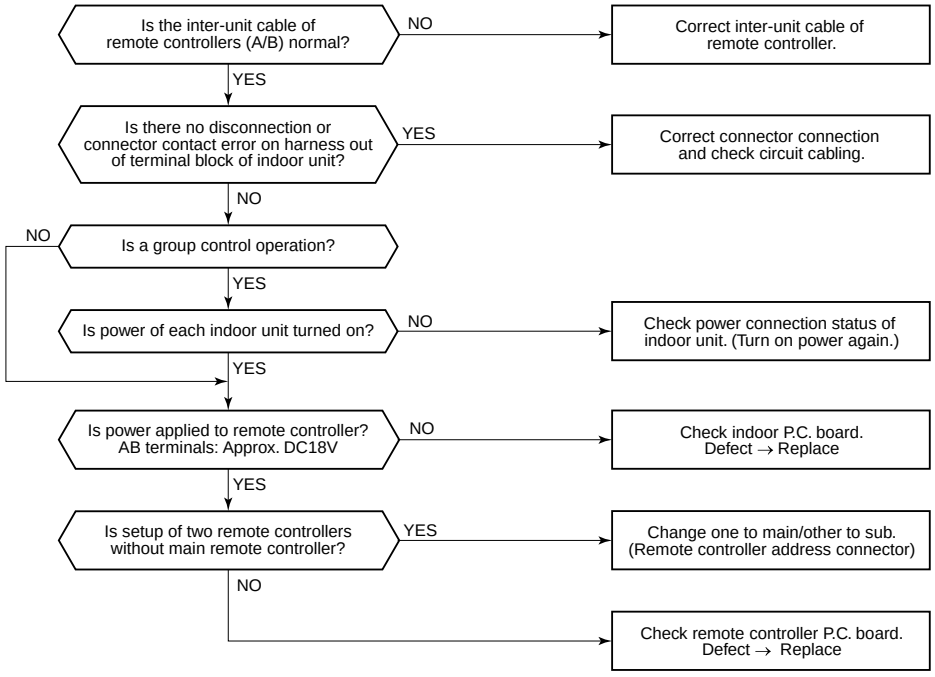
1. Turn off the power supply.
2. Remove the compressor lead cables from the compressors.
   In each compressor, check the winding resistance between phases and resistance of the outdoor cabinet using a tester.
   - Is not it earthed?
     → Normal if 10MΩ or more are measured
   - Is not shorted between windings?
     → Normal if 0.7Ω to 0.9Ω are measured (Use a precise digital tester.)

How to check the outdoor fan motor

1. Turn off the power supply.
2. Take off three connectors (U.V.W) from the fan IPDU P.C. board.
3. Turn the fan with hands. If the fan does not turn, it is a fan motor error (Lock). Replace the fan motor.
   If the fan turns, measure the winding resistance between the phases of the connector (Motor winding) with a tester. If 13 to 33Ω are measured, it is normal. (Use a digital tester.)

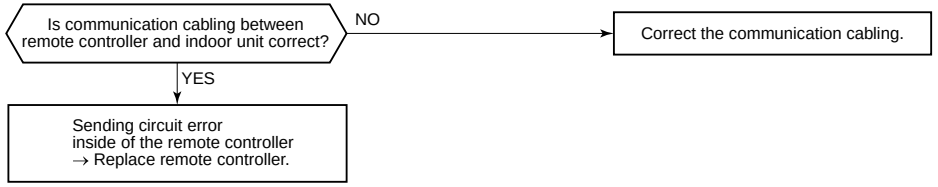
8-5. Diagnosis Procedure for Each Check Code

Check code	Check code name	Cause of operation
[E01] / [–] (d07 / AI-NET)	**Communication error between indoor and remote controller (Detected at remote controller side)**	1. Remote controller inter-unit cable error 2. Indoor power error 3. Indoor P.C. board error 4. Remote controller address setup error 5. Remote controller P.C. board error


Is the inter-unit cable of remote controllers (A/B) normal?
NO
Correct inter-unit cable of remote controller.
YES
Is there no disconnection or connector contact error on harness out of terminal block of indoor unit?
YES
Correct connector connection and check circuit cabling.
NO
NO
Is a group control operation?
YES
Is power of each indoor unit turned on?
NO
Check power connection status of indoor unit. (Turn on power again.)
YES
Is power applied to remote controller? AB terminals: Approx. DC18V
NO
Check indoor P.C. board. Defect → Replace
YES
Is setup of two remote controllers without main remote controller?
YES
Change one to main/other to sub. (Remote controller address connector)
NO
Check remote controller P.C. board. Defect → Replace

Check code	Check code name	Cause of operation
[E02] / [–] (d07 / AI-NET)	**Remote controller sending error**	Signal could not be sent to indoor unit. Check the communication wire of the remote controller.

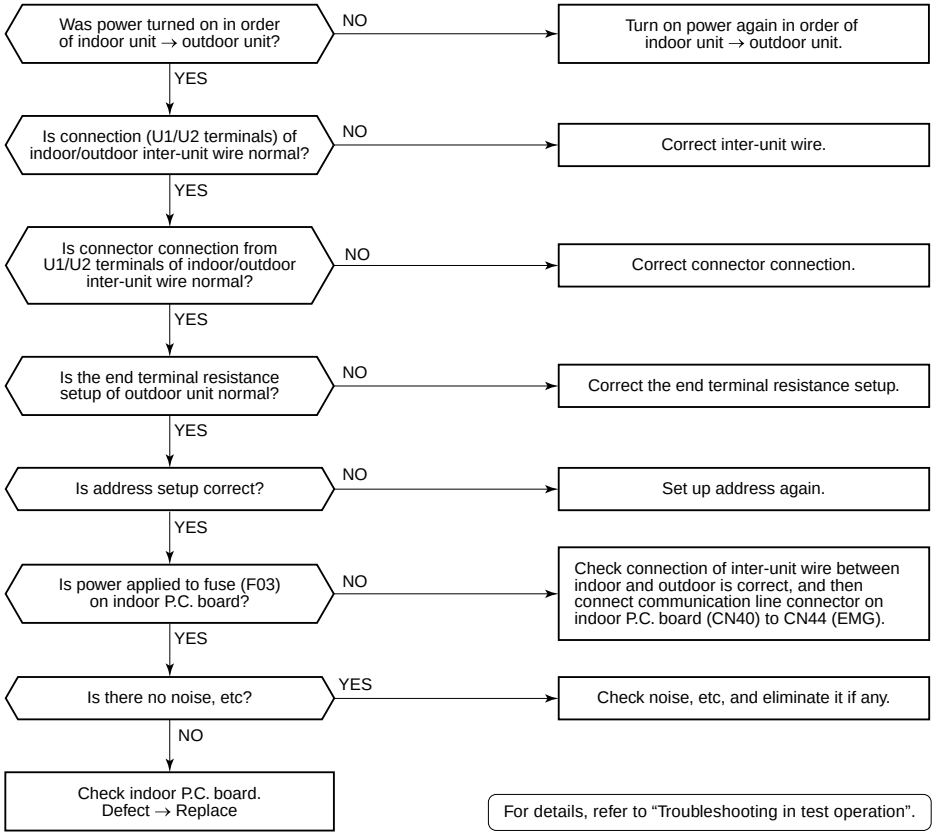
* It is not displayed on 7-segment display of the central control controller.


Is communication cabling between remote controller and indoor unit correct?
NO
Correct the communication cabling.
YES
Sending circuit error inside of the remote controller → Replace remote controller.

Check code	Check code name	Cause of operation
[E03] / [97] (d07 / AI-NET)	**Communication error between indoor and remote controller (Detected at indoor side)**	No communication from remote controller and communication adaptor

This error is detected when the indoor unit cannot receive a signal from the remote controller.
Check communication wires of the remote controllers A and B.
As communication is impossible, this check code [E03] is not displayed on the main remote controller.
It is displayed on TCC-LINK central controller.

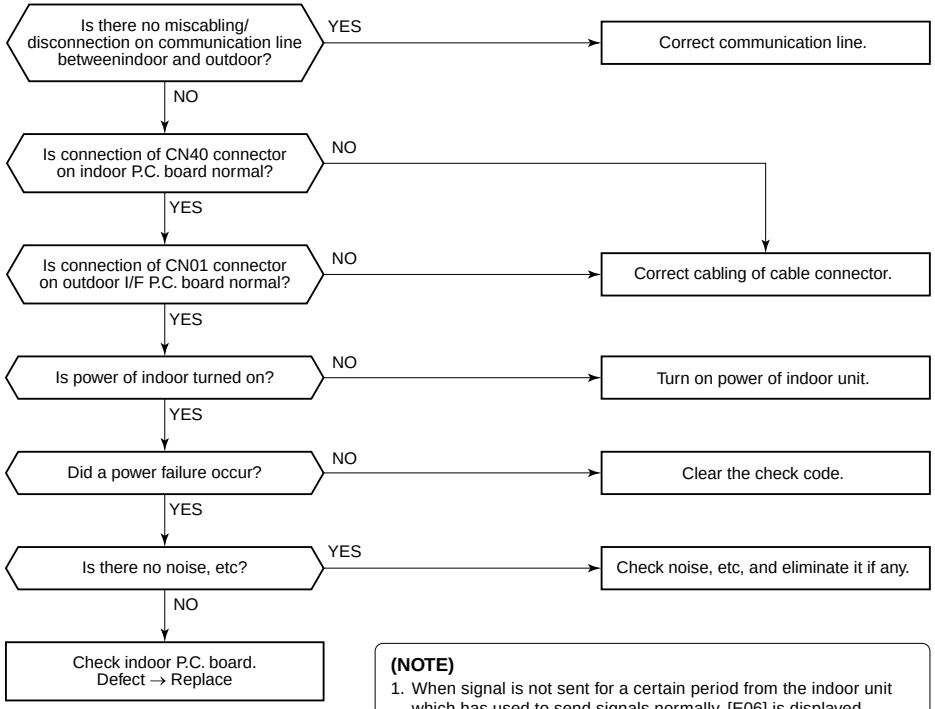
Check code	Check code name	Cause of operation
[E04] / [04] (d07 / AI-NET)	**Indoor/Outdoor communication circuit error (Detected at indoor side)**	1. Power of outdoor unit was firstly turned on. 2. Connection error of communication line between indoor and outdoor 3. End terminal resistance setup error on communication between indoor and outdoor 4. Address setup error


Was power turned on in order of indoor unit → outdoor unit?
NO
Turn on power again in order of indoor unit → outdoor unit.
YES
Is connection (U1/U2 terminals) of indoor/outdoor inter-unit wire normal?
NO
Correct inter-unit wire.
YES
Is connector connection from U1/U2 terminals of indoor/outdoor inter-unit wire normal?
NO
Correct connector connection.
YES
Is the end terminal resistance setup of outdoor unit normal?
NO
Correct the end terminal resistance setup.
YES
Is address setup correct?
NO
Set up address again.
YES
Is power applied to fuse (F03) on indoor P.C. board?
NO
Check connection of inter-unit wire between indoor and outdoor is correct, and then connect communication line connector on indoor P.C. board (CN40) to CN44 (EMG).
YES
Is there no noise, etc?
YES
Check noise, etc, and eliminate it if any.
NO
Check indoor P.C. board. Defect → Replace

For details, refer to “Troubleshooting in test operation”.

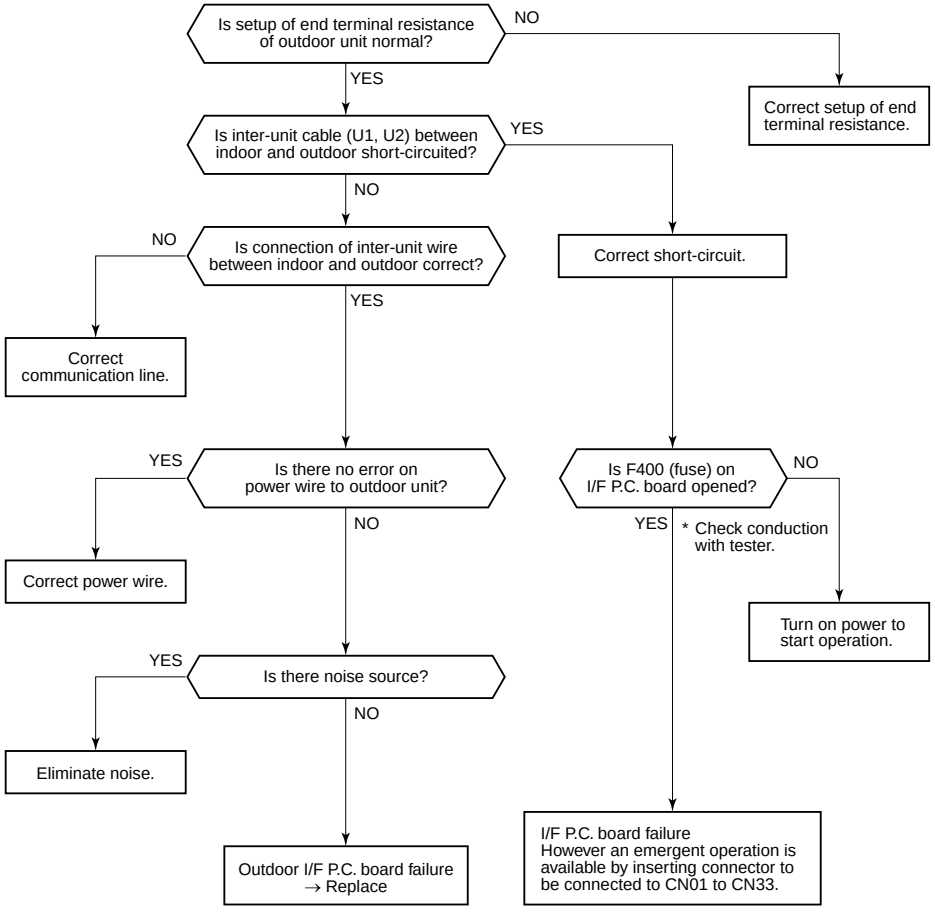
Check code	Check code name	Cause of operation
[E06] / [04] (d07 / AI-NET)	**Decreased number of indoor units**	1. Communication lines (U1, U2) connection error between indoor and outdoor 2. Connector connection error of communication for indoor P.C. board 3. Connector connection error of communication for outdoor I/F board 4. Power supply of indoor unit (Is power turned on?)

Sub-code: No. of indoor units which received signals normally



(NOTE)
1. When signal is not sent for a certain period from the indoor unit which has used to send signals normally, [E06] is displayed.

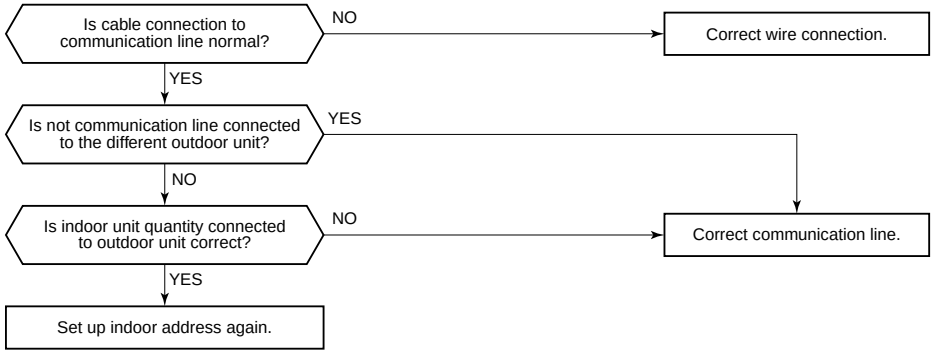
Check code	Check code name	Cause of operation
[E07] / [–] (d07 / AI-NET)	**Indoor/Outdoor communication circuit error (Detected at outdoor side)**	1. Indoor/outdoor communication end terminal resistance setup error 2. Indoor/outdoor communication connection error


Is setup of end terminal resistance of outdoor unit normal?
NO
Correct setup of end terminal resistance.
YES
Is inter-unit cable (U1, U2) between indoor and outdoor short-circuited?
YES
Correct short-circuit.
NO
Is connection of inter-unit wire between indoor and outdoor correct?
NO
Correct communication line.
YES
Is there no error on power wire to outdoor unit?
YES
Correct power wire.
NO
Is there noise source?
YES
Eliminate noise.
NO
Outdoor I/F P.C. board failure
→ Replace
Is F400 (fuse) on I/F P.C. board opened?
NO
Turn on power to start operation.
YES
* Check conduction with tester.
I/F P.C. board failure
However an emergent operation is available by inserting connector to be connected to CN01 to CN33.

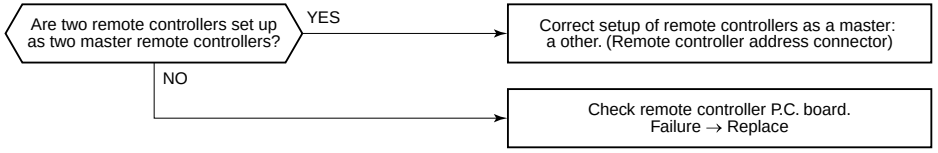
Check code	Check code name	Cause of operation
[E08] / [96] (d07 / AI-NET)	**Duplicated indoor addresses**	Indoor addresses are duplicated.

Sub-code: Duplicated indoor address

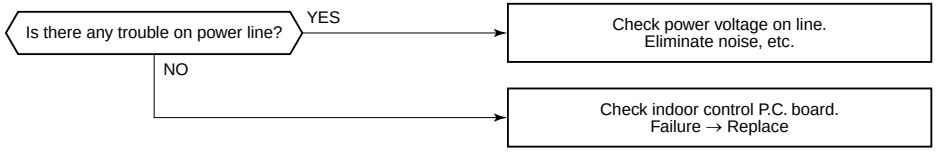
Using a main remote controller (RBC-AMT21E), check the setup item codes (DN code) 12, 13, and 14.
When there is no address duplication, check to the following flowchart.



Check code	Check code name	Cause of operation
[E09] / [99] (d07 / AI-NET)	**Duplicated master remote controller**	Setup of master remote controller is duplicated.

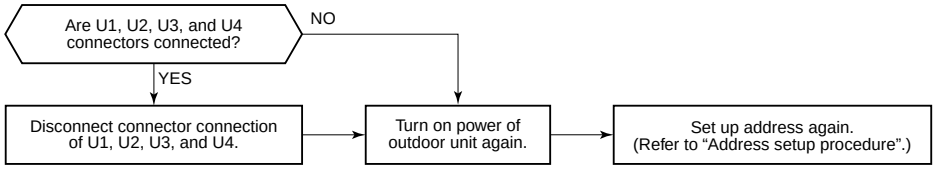

Are two remote controllers set up as two master remote controllers?
YES
Correct setup of remote controllers as a master: a other. (Remote controller address connector)
NO
Check remote controller P.C. board.
Failure → Replace

Check code	Check code name	Cause of operation
[E10] / [CF] (d07 / AI-NET)	**Communication error in indoor P.C. board A'ssy**	Indoor P.C. board error A'ssy failure

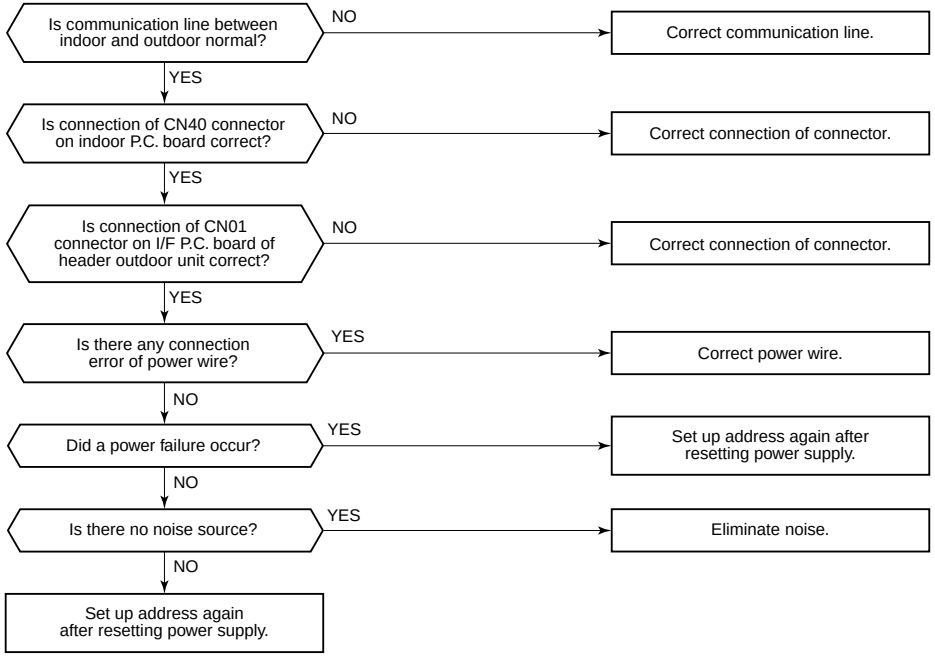


Check code	Check code name	Cause of operation
[E12] / [42] (d07 / AI-NET)	**Automatic address start error**	1. When indoor automatic address started, other refrigerant circuit system was setting automatic address. (Sub code : 01) 2. When outdoor automatic address started, the indoor automatic address was being set. (Sub-code: 02)

Sub-code: 01: Communication between indoor and outdoor 02: Communication between outdoor units

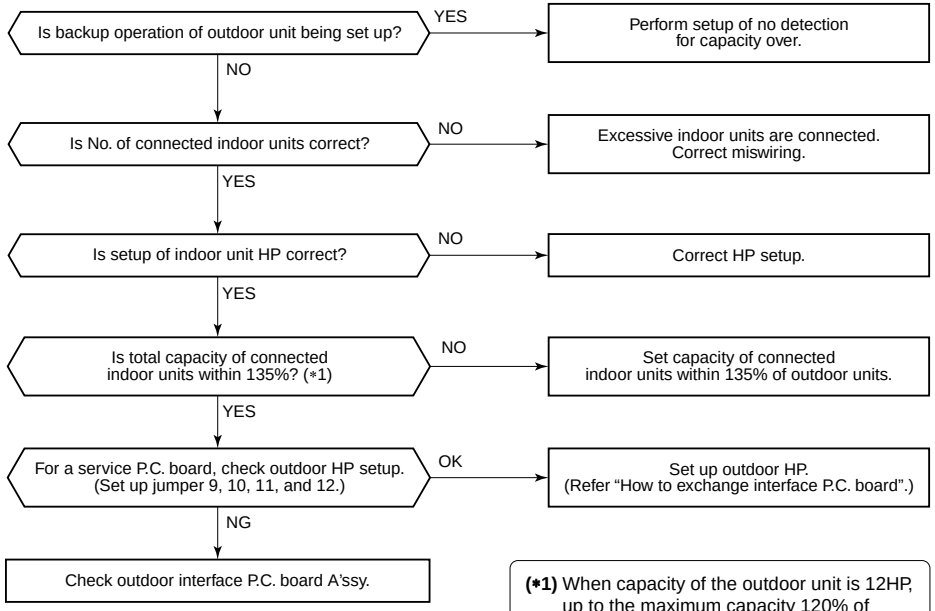

Are U1, U2, U3, and U4 connectors connected?
NO
YES
Disconnect connector connection of U1, U2, U3, and U4.
Turn on power of outdoor unit again.
Set up address again. (Refer to "Address setup procedure".)

Check code	Check code name	Cause of operation
[E15] / [42] (d07 / AI-NET)	**No corresponding indoor unit during automatic address**	1. Communication line connection error between indoor and outdoor. 2. Indoor power system error 3. Noise from surrounding devices 4. Power failure 5. Indoor P.C. board error



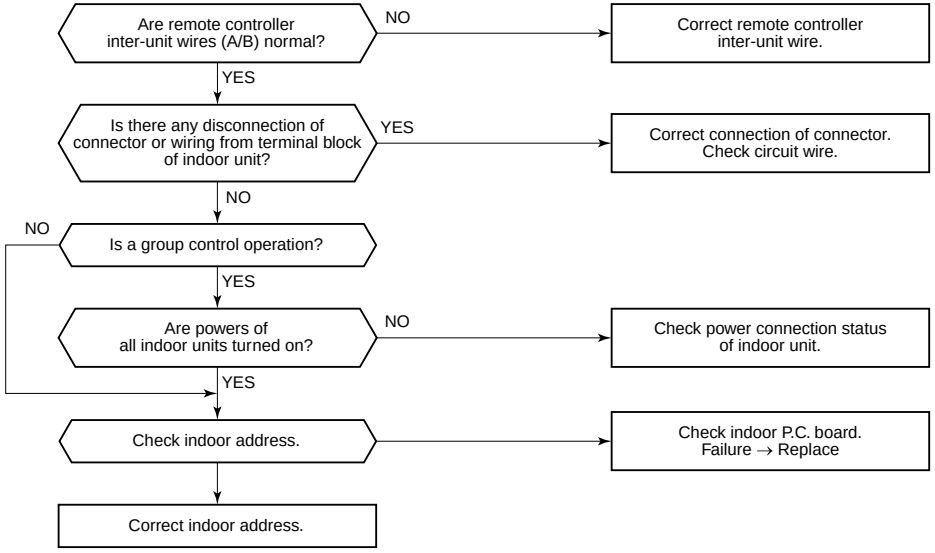
Check code	Check code name	Cause of operation
[E16] / [89] (d07 / AI-NET)	**Connected indoor units capacity over**	1. There are 48 or more connected indoor units. 2. Capacity over of total connected indoor units. 3. Incorrect setup of indoor/outdoor capacity

Sub-code: 00 : Capacity over 01 : ~ : Number of connected indoor units


Is backup operation of outdoor unit being set up?
YES
Perform setup of no detection for capacity over.
NO
Is No. of connected indoor units correct?
NO
Excessive indoor units are connected. Correct miswiring.
YES
Is setup of indoor unit HP correct?
NO
Correct HP setup.
YES
Is total capacity of connected indoor units within 135%? (∗1)
NO
Set capacity of connected indoor units within 135% of outdoor units.
YES
For a service P.C. board, check outdoor HP setup. (Set up jumper 9, 10, 11, and 12.)
OK
Set up outdoor HP. (Refer “How to exchange interface P.C. board”.)
NG
Check outdoor interface P.C. board A’ssy.

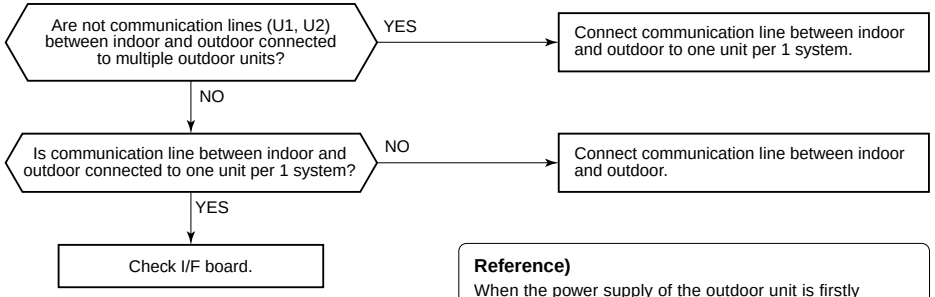
(∗1) When capacity of the outdoor unit is 12HP, up to the maximum capacity 120% of indoor units can be connected.

Check code	Check code name	Cause of operation
[E18] / [97/99] (d07 / AI-NET)	**Communication error between indoor header and follower**	Regular communication between indoor header and follower is unavailable.


Are remote controller inter-unit wires (A/B) normal?
NO
Correct remote controller inter-unit wire.
YES
Is there any disconnection of connector or wiring from terminal block of indoor unit?
YES
Correct connection of connector. Check circuit wire.
NO
NO
Is a group control operation?
YES
Are powers of all indoor units turned on?
NO
Check power connection status of indoor unit.
YES
Check indoor address.
Check indoor P.C. board. Failure → Replace
Correct indoor address.

Check code	Check code name	Cause of operation
[E19] / [96] (d07 / AI-NET)	**Header outdoor units quantity error**	1. Misconnection of inter-unit cable between indoor and outdoor 2. Outdoor I/F P.C. board error

Sub-code: 00: No header unit 02: Two or more header units


Are not communication lines (U1, U2) between indoor and outdoor connected to multiple outdoor units?
YES
Connect communication line between indoor and outdoor to one unit per 1 system.
NO
Is communication line between indoor and outdoor connected to one unit per 1 system?
NO
Connect communication line between indoor and outdoor.
YES
Check I/F board.

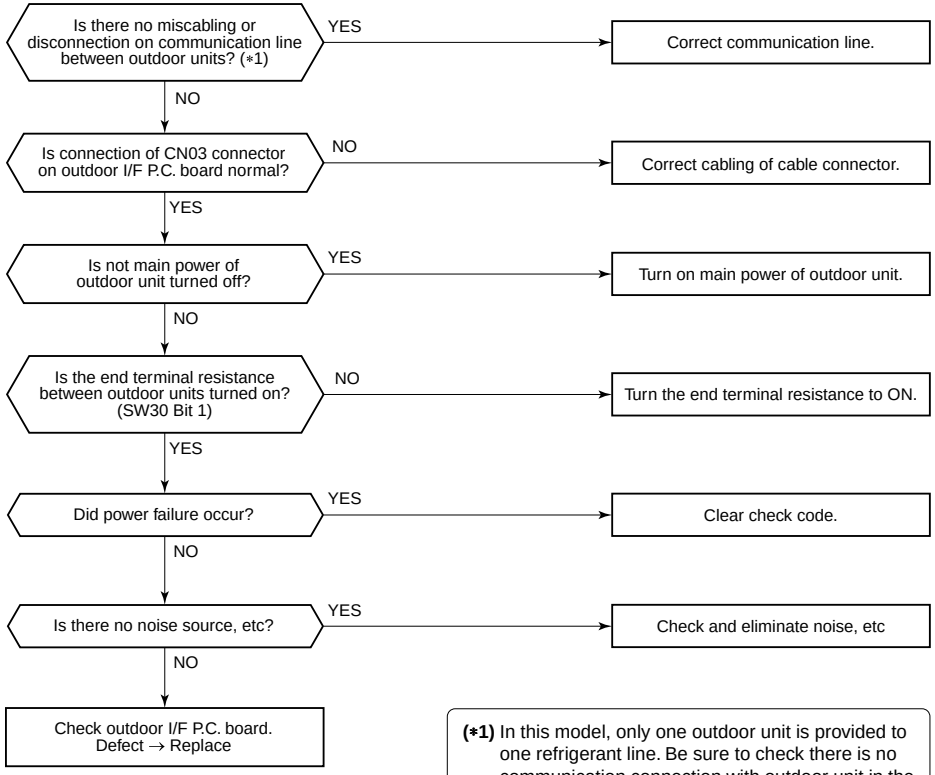
Reference)
When the power supply of the outdoor unit is firstly turned on, the check code [E19 00] is displayed until the power supplies of the indoor units are turned on. However it is not an error. If the power supplies of the indoor units are turned on, the check code is automatically reset.

Check code	Check code name	Cause of operation
[E20] / [42] (d07 / AI-NET)	**Unit connected to other line during automatic address**	When starting automatic indoor address, a device in other line is connected.

Sub-code: 01: Connection of outdoor in other line 02: Connection of indoor unit in other line

Separate the wire between lines according to address setup method.

Check code	Check code name	Cause of operation
[E23] / [15] (d07 / AI-NET)	**Communication sending error between outdoor units**	1. Inter-unit cable connection error between outdoor units 2. Communication connector connection error between outdoor units, I/F P.C. board error 3. End terminal resistance setup error between outdoor units


Is there no miscabling or disconnection on communication line between outdoor units? (∗1)
YES
Correct communication line.
NO
Is connection of CN03 connector on outdoor I/F P.C. board normal?
NO
Correct cabling of cable connector.
YES
Is not main power of outdoor unit turned off?
YES
Turn on main power of outdoor unit.
NO
Is the end terminal resistance between outdoor units turned on? (SW30 Bit 1)
NO
Turn the end terminal resistance to ON.
YES
Did power failure occur?
YES
Clear check code.
NO
Is there no noise source, etc?
YES
Check and eliminate noise, etc
NO
Check outdoor I/F P.C. board.
Defect → Replace

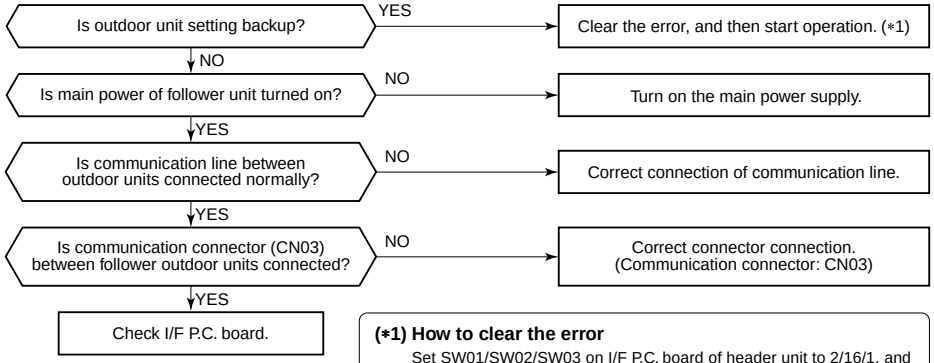
(∗1) In this model, only one outdoor unit is provided to one refrigerant line. Be sure to check there is no communication connection with outdoor unit in the other refrigerant line.

Check code	Check code name	Cause of operation
[E25] / [15] (d07 / AI-NET)	**Duplicated address setup of terminal outdoor units**	Addresses are duplicated by manual setting of outdoor address

Never set up the outdoor address manually.

Check code	Check code name	Cause of operation
[E26] / [15] (d07 / AI-NET)	**Decrease of connected outdoor units**	1. Outdoor unit backup setup 2. Outdoor power error 3. Communication line connection error between outdoor units 4. Connector connection error for communication 5. Outdoor I/F P.C. board error

Sub-code: No. of outdoor units which received signals normally



(∗1) How to clear the error
Set SW01/SW02/SW03 on I/F P.C. board of header unit to 2/16/1, and push SW04 for 5 seconds or more. (7-segment display: [Er.] [CL])

- In this model, only one outdoor unit is provided to one refrigerant line. Be sure to check there is no communication connection with outdoor unit in the other refrigerant line.

Check code	Check code name	Cause of operation
[E28] / [d2] (d07 / AI-NET)	**Terminal outdoor unit error**	Terminal unit error

Sub-code: Detected outdoor unit number

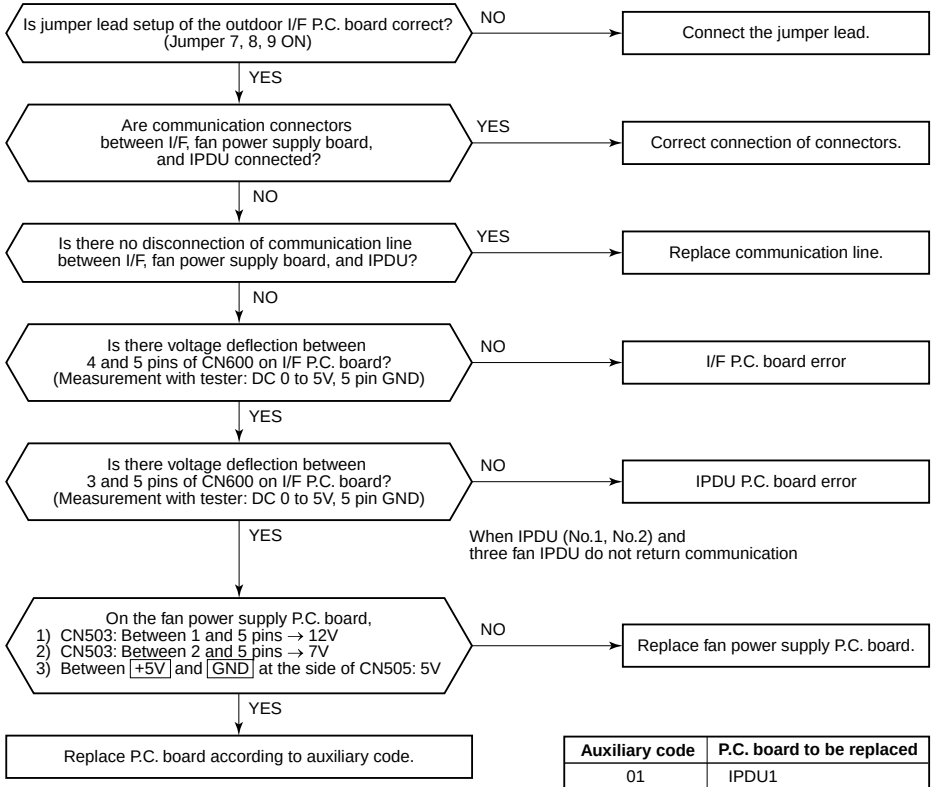
SAn error occurred on the terminal unit. Confirm the check code of the terminal unit using 7-segment display on the I/F P.C. board of the terminal unit and check it according to the diagnostic procedure for each check code.
<How to specify the terminal outdoor unit on which error occurred>
Under condition that [E28] is displayed on the 7-segment display of the header unit, when pushing SW04 for 1 second or more, the fan of the outdoor unit which stopped due to the error rotates. If pushing SW05 alone, fan running is released.

Check code	Check code name	Cause of operation
[E31] / [CF] (d07 / AI-NET)	**IPDU communication error**	1. Connection error of communication line between IPDU and I/F P.C. board 2. I/F P.C. board error 3. IPDU P.C. board error 4. External noise

Sub-code:

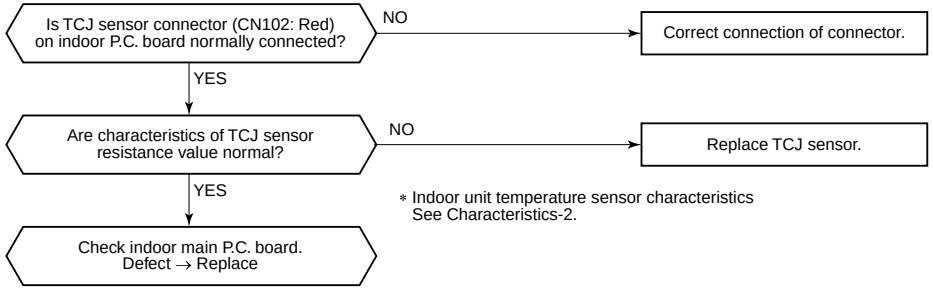
01: IPDU1 error
02: IPDU2 error
03: IPDU1, 2 error
04: Fan IPDU error
05: IPDU1, fan IPDU error
06: IPDU2, fan IPDU error
07: All IPDU error or communication line error between IPDU-I/F P.C. boards, or outdoor I/F P.C. board error

∗ If the fan IPDU is abnormal, be sure to check the voltage output on the fan power supply P.C. board.


Is jumper lead setup of the outdoor I/F P.C. board correct? (Jumper 7, 8, 9 ON)
NO
Connect the jumper lead.
YES
Are communication connectors between I/F, fan power supply board, and IPDU connected?
YES
Correct connection of connectors.
NO
Is there no disconnection of communication line between I/F, fan power supply board, and IPDU?
YES
Replace communication line.
NO
Is there voltage deflection between 4 and 5 pins of CN600 on I/F P.C. board? (Measurement with tester: DC 0 to 5V, 5 pin GND)
NO
I/F P.C. board error
YES
Is there voltage deflection between 3 and 5 pins of CN600 on I/F P.C. board? (Measurement with tester: DC 0 to 5V, 5 pin GND)
NO
IPDU P.C. board error
YES
When IPDU (No.1, No.2) and three fan IPDU do not return communication
On the fan power supply P.C. board,
1) CN503: Between 1 and 5 pins → 12V
2) CN503: Between 2 and 5 pins → 7V
3) Between +5V and GND at the side of CN505: 5V
NO
Replace fan power supply P.C. board.
YES
Replace P.C. board according to auxiliary code.

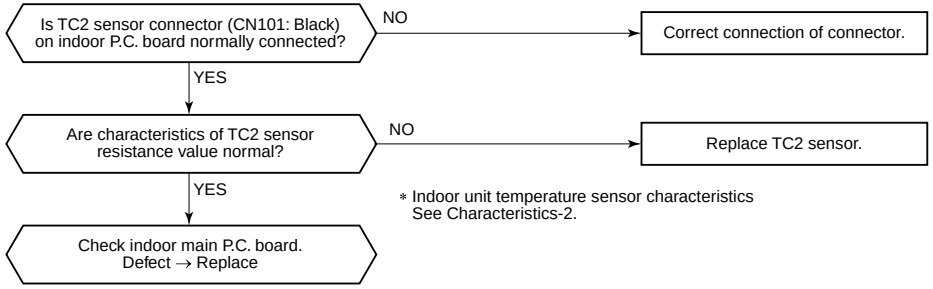
Auxiliary code	P.C. board to be replaced
01	IPDU1
02	IPDU2
03	IPDU1, 2
04	Fan IPDU
05	IPDU1, fan IPDU
06	IPDU2, fan IPDU
07	IPDU1, 2, fan IPDU, I/F

Check code	Check code name	Cause of operation
[F01] / [0F] (d07 / AI-NET)	**Indoor TCJ sensor error**	TCJ sensor Open/Short


Is TCJ sensor connector (CN102: Red) on indoor P.C. board normally connected?
NO
Correct connection of connector.
YES
Are characteristics of TCJ sensor resistance value normal?
NO
Replace TCJ sensor.
YES
Check indoor main P.C. board. Defect → Replace

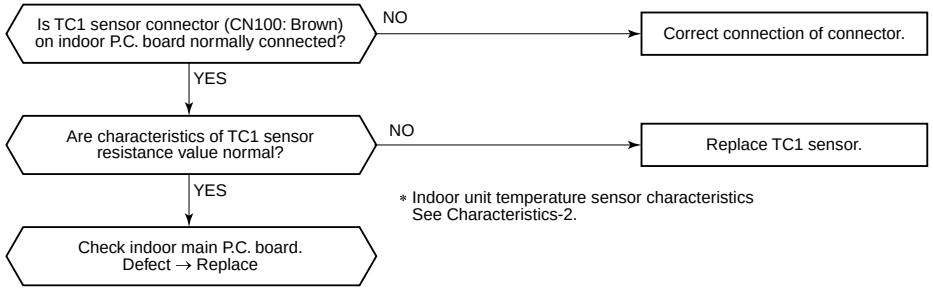
∗ Indoor unit temperature sensor characteristics See Characteristics-2.

Check code	Check code name	Cause of operation
[F02] / [0d] (d07 / AI-NET)	**Indoor TC2 sensor error**	TC2 sensor Open/Short


Is TC2 sensor connector (CN101: Black) on indoor P.C. board normally connected?
NO
Correct connection of connector.
YES
Are characteristics of TC2 sensor resistance value normal?
NO
Replace TC2 sensor.
YES
Check indoor main P.C. board. Defect → Replace

∗ Indoor unit temperature sensor characteristics See Characteristics-2.

Check code	Check code name	Cause of operation
[F03] / [93] (d07 / AI-NET)	**Indoor TC1 sensor error**	TC1 sensor Open/Short


Is TC1 sensor connector (CN100: Brown) on indoor P.C. board normally connected?
NO
Correct connection of connector.
YES
Are characteristics of TC1 sensor resistance value normal?
NO
Replace TC1 sensor.
YES
Check indoor main P.C. board. Defect → Replace

∗ Indoor unit temperature sensor characteristics See Characteristics-2.

Check code	Check code name	Cause of operation
[F04] / [19] (d07 / AI-NET)	**TD1 sensor error**	TD1 sensor Open/Short

This error code means detection of Open/Short of TD1 sensor. Check disconnection of circuit for connection of connector (TD1 sensor: CN502, White) and characteristics of sensor resistance value.
(Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace outdoor I/F P.C. board.

Check code	Check code name	Cause of operation
[F05] / [A1] (d07 / AI-NET)	**TD2 sensor error**	TD2 sensor Open/Short

This error code means detection of Open/Short of TD2 sensor. Check disconnection of circuit for connection of connector (TD2 sensor: CN503, Pink) and characteristics of sensor resistance value.
(Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace outdoor I/F P.C. board.

Check code	Check code name	Cause of operation
[F06] / [18] (d07 / AI-NET)	**TE1 sensor error**	TE1 sensor Open/Short

This error code means detection of Open/Short of TE1 sensor. Check disconnection of circuit for connection of connector (TE1 sensor: CN505, Green) and characteristics of sensor resistance value.
(Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace outdoor I/F P.C. board.

Check code name	Check code name	Cause of operation
[F07] / [18] (d07 / AI-NET)	**TL sensor error**	TL sensor Open/Short

This error code means detection of Open/Short of TL sensor. Check disconnection of circuit for connection of connector (TL sensor: CN521, White) and characteristics of sensor resistance value.
(Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace outdoor I/F P.C. board.

Check code name	Check code name	Cause of operation
[F08] / [1b] (d07 / AI-NET)	**TO sensor error**	TO sensor Open/Short

This error code means detection of Open/Short of TO sensor. Check disconnection of circuit for connection of connector (TO sensor: CN507, Yellow) and characteristics of sensor resistance value.
(Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace outdoor I/F P.C. board.

Check code name	Check code name	Cause of operation
[F10] / [0C] (d07 / AI-NET)	**Indoor TA sensor error**	TA sensor Open/Short

This error code means detection of Open/Short of TA sensor. Check disconnection of circuit for connection of connector (TA sensor: CN104, Yellow) and characteristics of sensor resistance value. (Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace indoor P.C. board.

Check code name	Check code name	Cause of operation
[F12] / [A2] (d07 / AI-NET)	**TS sensor error**	TS1, TS2 sensor Open/Short

Sub-code: 01: TS1 sensor 02 : TS2 sensor

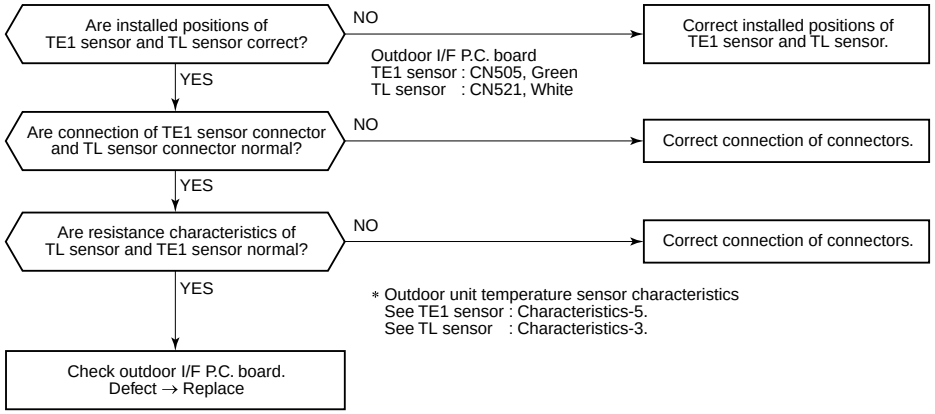
This error code means detection of Open/Short of TS sensor. Check disconnection of circuit for connection of connector (TS1 sensor: CN504, White TS2 sensor: CN522, Black) and characteristics of sensor resistance value.
(Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace outdoor I/F P.C. board.

Check code name	Check code name	Cause of operation
[F13] / [43] (d07 / AI-NET)	**TH sensor error**	IGBT built-in sensor error in A3-IPDU

Sub-code: 01: Compressor 1 side 02: Compressor 2 side

This error code means IGBT built-in temperature sensor error.
Check connection of connectors CN06 on IPDU P.C. board and CN600 on I/F P.C. board.
If sensor is normal, replace IPDU P.C. board.

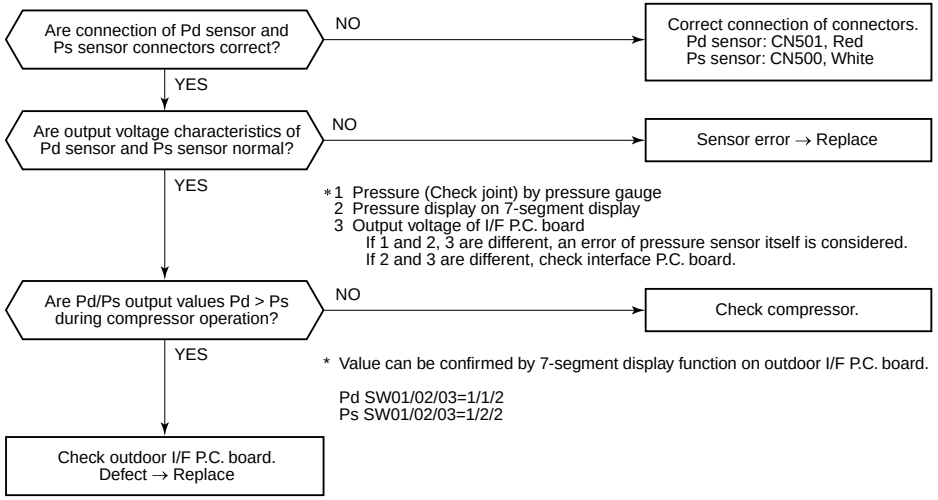
Check code name	Check code name	Cause of operation
[F15] / [18] (d07 / AI-NET)	**Outdoor temp sensor miscabling (TE1, TL)**	1. Misinstallation and misconnection of TE1 sensor and TL sensor 2. Resistance characteristics error of TE1 sensor and TL sensor 3. Outdoor P.C. board (I/F) error


Are installed positions of TE1 sensor and TL sensor correct?
NO
Correct installed positions of TE1 sensor and TL sensor.
Outdoor I/F P.C. board
TE1 sensor : CN505, Green
TL sensor : CN521, White
YES
Are connection of TE1 sensor connector and TL sensor connector normal?
NO
Correct connection of connectors.
YES
Are resistance characteristics of TL sensor and TE1 sensor normal?
NO
Correct connection of connectors.
YES
Check outdoor I/F P.C. board.
Defect → Replace

∗ Outdoor unit temperature sensor characteristics
See TE1 sensor : Characteristics-5.
See TL sensor : Characteristics-3.

∗ TE1 sensor : Outdoor heat exchanger temp sensor
TL sensor : Temp sensor between liquid tanks of outdoor PMV1/2

Check code name	Check code name	Cause of operation
[F16] / [43] (d07 / AI-NET)	**Outdoor pressure sensor miscabling (Pd, Ps)**	1. High-pressure Pd sensor and low-pressure sensor Ps are exchanged. 2. Output voltage of each sensor is zero.

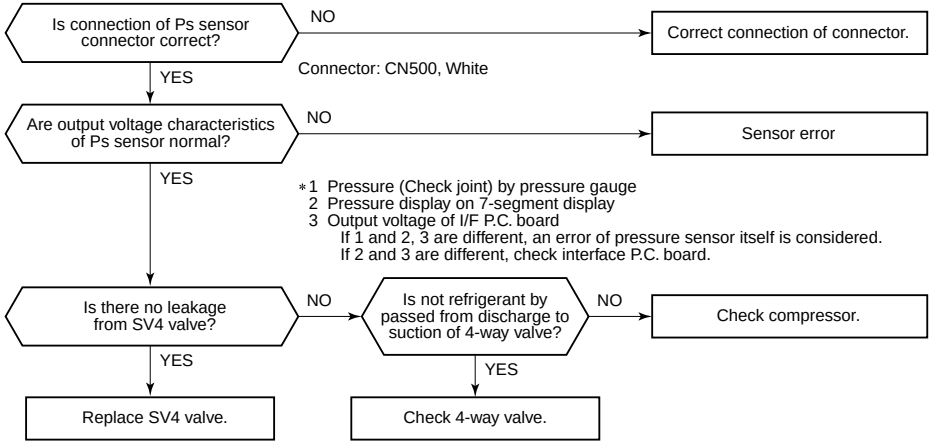


∗1 Pressure (Check joint) by pressure gauge
2 Pressure display on 7-segment display
3 Output voltage of I/F P.C. board
If 1 and 2, 3 are different, an error of pressure sensor itself is considered.
If 2 and 3 are different, check interface P.C. board.

* Value can be confirmed by 7-segment display function on outdoor I/F P.C. board.

Pd SW01/02/03=1/1/2
Ps SW01/02/03=1/2/2

Check code name	Check code name	Cause of operation
[F23] / [43] (d07 / AI-NET)	**Ps sensor error**	Output voltage error of Ps sensor



∗1 Pressure (Check joint) by pressure gauge
2 Pressure display on 7-segment display
3 Output voltage of I/F P.C. board
If 1 and 2, 3 are different, an error of pressure sensor itself is considered.
If 2 and 3 are different, check interface P.C. board.

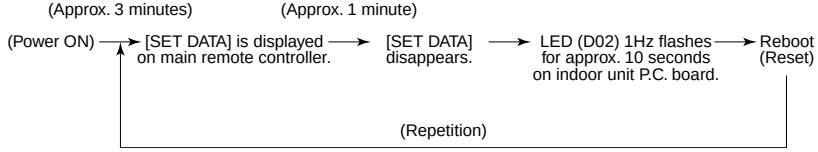
Check code name	Check code name	Cause of operation
[F24] / [43] (d07 / AI-NET)	**Pd sensor error**	Output voltage error of Pd sensor

It is output voltage error of Pd sensor. Check disconnection of connection of connector (Pd sensor: CN501) circuit and output voltage of sensor.
If the sensor is normal, replace outdoor I/F P.C. board.

Check code name	Check code name	Cause of operation
[F29] / [12] (d07 / AI-NET)	**Indoor other error**	Indoor P.C. board error EEROM error

This error is detected during operation of air conditioner of IC10 non-volatile memory (EEPROM) on indoor unit P.C. board. Replace service P.C. board.

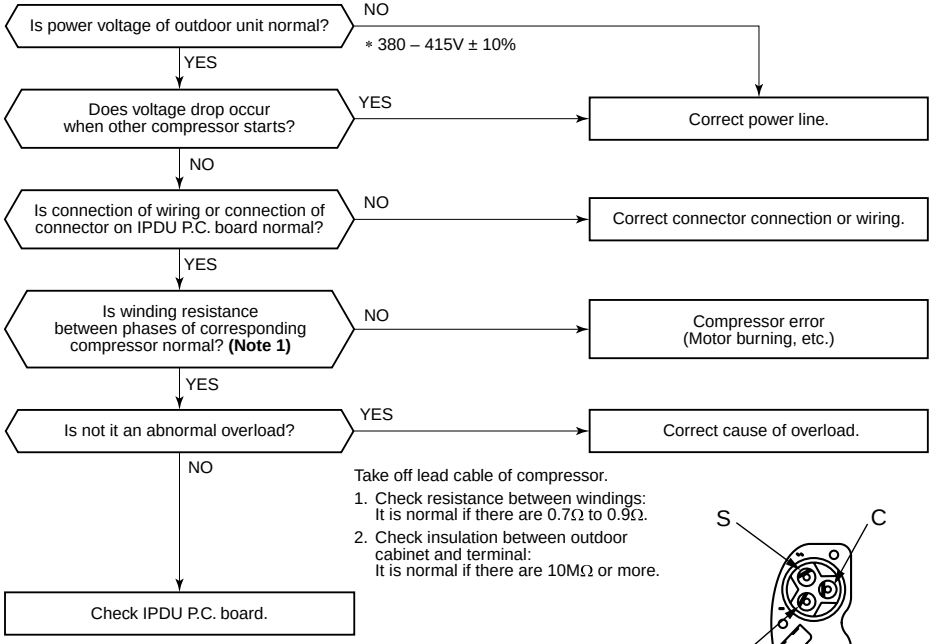
∗ If EEPROM was not inserted when power was turned on or it is absolutely impossible to read/write EEPROM data, the automatic address mode is repeated. In this case, [97 error] is displayed on AI-NET central controller.


(Approx. 3 minutes)
(Approx. 1 minute)
(Power ON)
[SET DATA] is displayed on main remote controller.
[SET DATA] disappears.
LED (D02) 1Hz flashes for approx. 10 seconds on indoor unit P.C. board.
Reboot (Reset)
(Repetition)

Check code name	Check code name	Cause of operation
[F31] / [1C] (d07 / AI-NET)	**Outdoor EEPROM error**	1. Outdoor unit power error (Voltage, noise, etc.) 2. Outdoor I/F P.C. board error

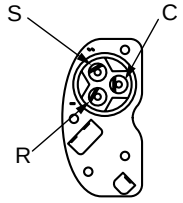
Check code name	Check code name	Cause of operation
[H01] / [1F] (d07 / AI-NET)	**Compressor breakdown**	1. Outdoor unit power line error 2. Compressor circuit system error 3. Compressor error 4. Cause of abnormal overload operation 5. IPDU P.C. board error

Sub-code: 01: Compressor 1 side 02: Compressor 2 side



Take off lead cable of compressor.

1. Check resistance between windings:
   It is normal if there are 0.7Ω to 0.9Ω.
2. Check insulation between outdoor cabinet and terminal:
   It is normal if there are 10MΩ or more.



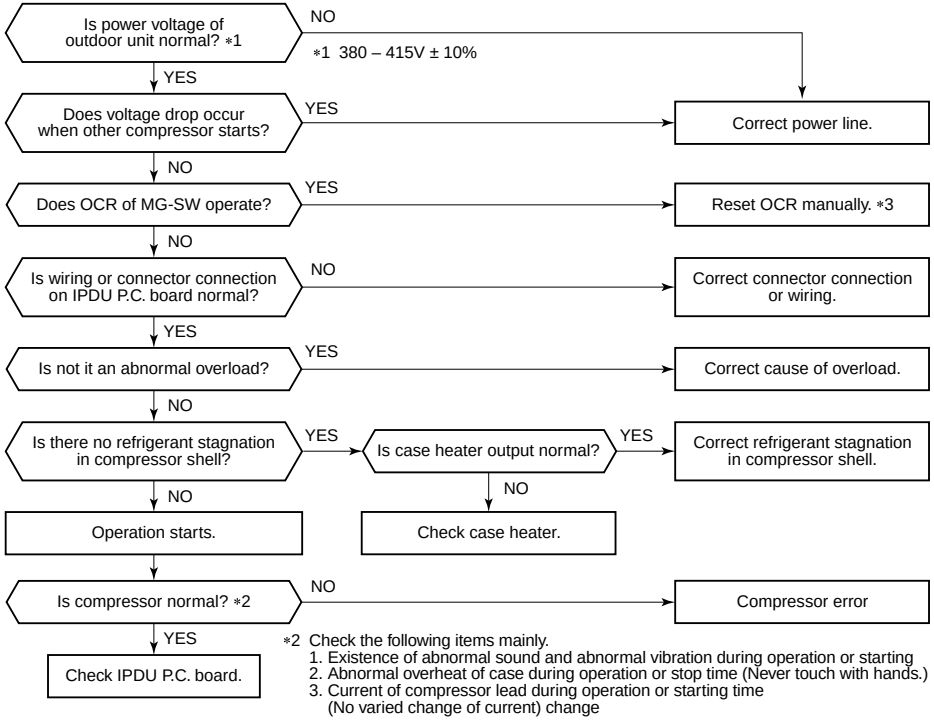
Details of compressor power connecting section

Note 1

* After checking the output, when connecting the compressor lead again to the compressor terminal, check surely there is no distortion on the Fasten receptacle terminal.
If it is loosened, caulk it with pinchers, etc and then connect lead to the terminal firmly.

Check code name	Check code name	Cause of operation
[H02] / [1d] (d07 / AI-NET)	**Compressor error (Lock)**	1. Outdoor unit power line error 2. Compressor circuit system error 3. Compressor error 4. Refrigerant stagnation in compressor shell 5. IPDU P.C. board error

Sub-code: 01: Compressor 1 side 02: Compressor 2 side

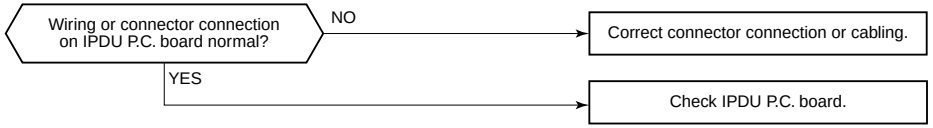


∗2 Check the following items mainly.
1. Existence of abnormal sound and abnormal vibration during operation or starting
2. Abnormal overheat of case during operation or stop time (Never touch with hands.)
3. Current of compressor lead during operation or starting time (No varied change of current) change

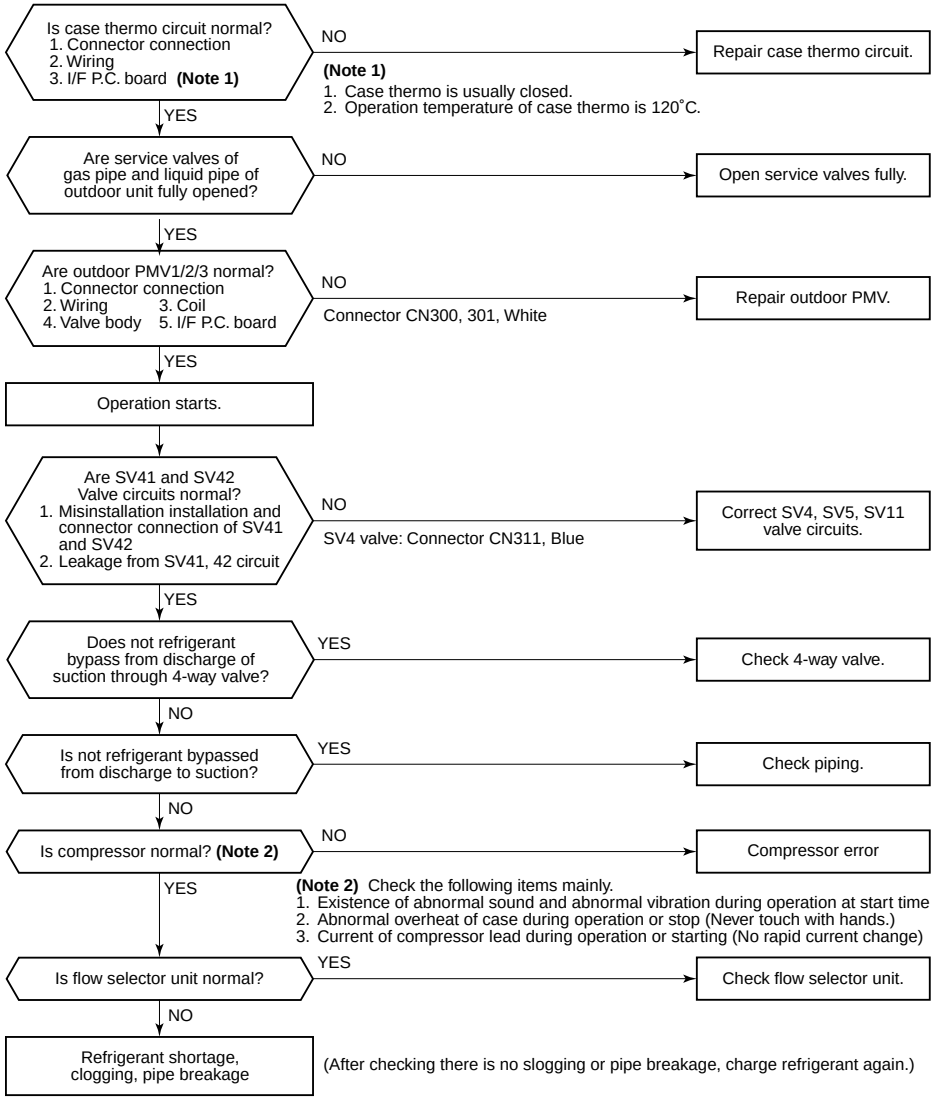
∗3 If OCR operates even after manual reset of OCR, check whether the wiring to the current sensor (T02) of Comp-IPDU is correct or not.

Check code name	Check code name	Cause of operation
[H03] / [17] (d07 / AI-NET)	**Current detective circuit system error**	1. Cabling or connector connection error on IPDU P.C. board 2. IPDU P.C. board error

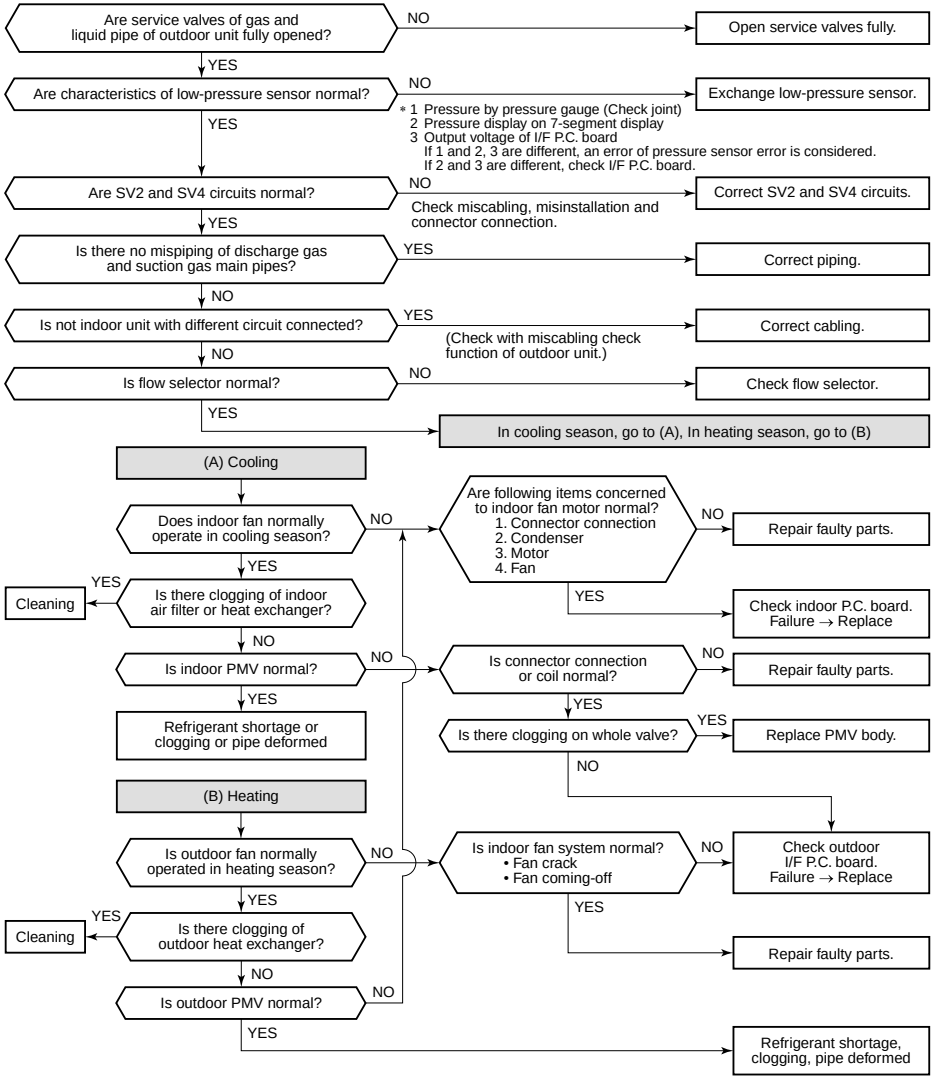
Sub-code: 01: Compressor 1 side 02: Compressor 2 side


Wiring or connector connection on IPDU P.C. board normal?
NO
Correct connector connection or cabling.
YES
Check IPDU P.C. board.

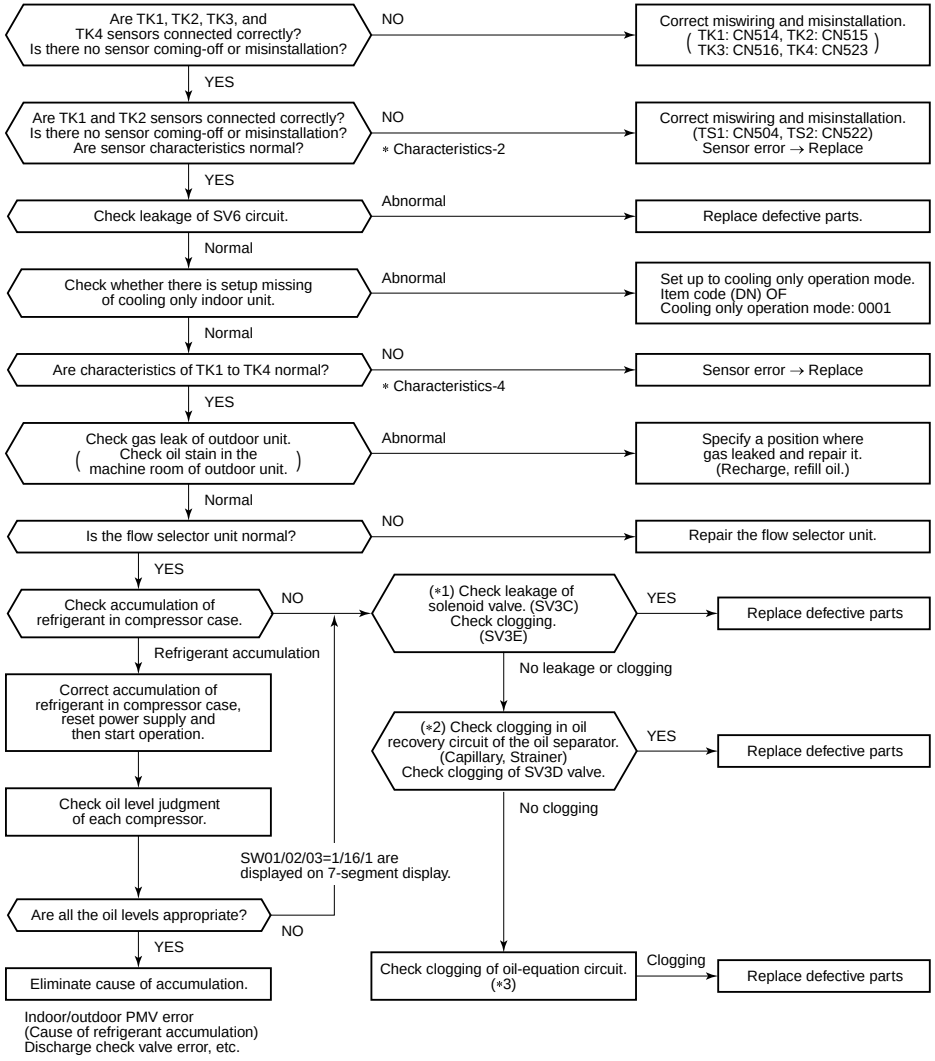
Check code name	Check code name	Cause of operation
[H04] / [44] (d07 / AI-NET) **[H14] / [44]** (d07 / AI-NET)	**Compressor 1 case thermo operation** **Compressor 2 case thermo operation**	1. Case thermo circuit error 2. I/F P.C. board error 3. Service valve closed 4. Outdoor PMV clogging 5. SV4 valve leak, Coil misinstallation 6. 4-way valve error 7. Compressor error 8. Refrigerant shortage


Is case thermo circuit normal?
1. Connector connection
2. Wiring
3. I/F P.C. board (Note 1)
NO
Repair case thermo circuit.
(Note 1)
1. Case thermo is usually closed.
2. Operation temperature of case thermo is 120˚C.
YES
Are service valves of gas pipe and liquid pipe of outdoor unit fully opened?
NO
Open service valves fully.
YES
Are outdoor PMV1/2/3 normal?
1. Connector connection
2. Wiring 3. Coil
4. Valve body 5. I/F P.C. board
NO
Repair outdoor PMV.
Connector CN300, 301, White
YES
Operation starts.
Are SV41 and SV42 Valve circuits normal?
1. Misinstallation installation and connector connection of SV41 and SV42
2. Leakage from SV41, 42 circuit
NO
Correct SV4, SV5, SV11 valve circuits.
SV4 valve: Connector CN311, Blue
YES
Does not refrigerant bypass from discharge of suction through 4-way valve?
YES
Check 4-way valve.
NO
Is not refrigerant bypassed from discharge to suction?
YES
Check piping.
NO
Is compressor normal? (Note 2)
NO
Compressor error
YES
(Note 2) Check the following items mainly.
1. Existence of abnormal sound and abnormal vibration during operation at start time
2. Abnormal overheat of case during operation or stop (Never touch with hands.)
3. Current of compressor lead during operation or starting (No rapid current change)
Is flow selector unit normal?
YES
Check flow selector unit.
NO
Refrigerant shortage, clogging, pipe breakage
(After checking there is no slogging or pipe breakage, charge refrigerant again.)

Check code name	Check code name	Cause of operation
[H06] / [20] (d07 / AI-NET)	**Low-pressure protective operation**	1. Service valve close 2. Ps sensor error 3. SV2, SV4 circuit error 4. Miscabling of communication between indoor and outdoor 5. Indoor/outdoor fan and condenser error 6. Indoor/outdoor PMV clogging 7. Indoor/outdoor heat exchanger clogging 8. Refrigerant shortage



Check code name	Check code name	Cause of operation
[H07] / [d7] (d07 / AI-NET)	**Oil level down detection protection**	1. Valves of balance pipes closed. 2. Miscabling or misinstallation of TK1 to TK4 sensors 3. TK1 to TK4 sensor error 4. Gas leak or oil leak of all outdoor units 5. Refrigerant stagnation of compressor case 6. SV3A, 3B, 3D, 3C, 3E valve error 7. Clogging of oil return circuit from oil separator 8. Clogging of oil-equation circuit system


Are TK1, TK2, TK3, and TK4 sensors connected correctly? Is there no sensor coming-off or misinstallation?
NO
Correct miswiring and misinstallation. (TK1: CN514, TK2: CN515 TK3: CN516, TK4: CN523)
YES
Are TK1 and TK2 sensors connected correctly? Is there no sensor coming-off or misinstallation? Are sensor characteristics normal?
NO
∗ Characteristics-2
Correct miswiring and misinstallation. (TS1: CN504, TS2: CN522) Sensor error → Replace
YES
Check leakage of SV6 circuit.
Abnormal
Replace defective parts.
Normal
Check whether there is setup missing of cooling only indoor unit.
Abnormal
Set up to cooling only operation mode. Item code (DN) OF Cooling only operation mode: 0001
Normal
Are characteristics of TK1 to TK4 normal?
NO
∗ Characteristics-4
Sensor error → Replace
YES
Check gas leak of outdoor unit. (Check oil stain in the machine room of outdoor unit.)
Abnormal
Specify a position where gas leaked and repair it. (Recharge, refill oil.)
Normal
Is the flow selector unit normal?
NO
Repair the flow selector unit.
YES
Check accumulation of refrigerant in compressor case.
NO
(∗1) Check leakage of solenoid valve. (SV3C) Check clogging. (SV3E)
YES
Replace defective parts
Refrigerant accumulation
No leakage or clogging
Correct accumulation of refrigerant in compressor case, reset power supply and then start operation.
(∗2) Check clogging in oil recovery circuit of the oil separator. (Capillary, Strainer) Check clogging of SV3D valve.
YES
Replace defective parts
Check oil level judgment of each compressor.
No clogging
SW01/02/03=1/16/1 are displayed on 7-segment display.
Are all the oil levels appropriate?
NO
YES
Eliminate cause of accumulation.
Check clogging of oil-equation circuit. (∗3)
Clogging
Replace defective parts
Indoor/outdoor PMV error (Cause of refrigerant accumulation) Discharge check valve error, etc.

(Reference) If refrigerant is accumulated in the compressor case, oil level short may be judged.

In some cases, it may be difficult to check the leakage of clogging in the following condition of refrigerant stagnation in low ambient temperature condition.
In this case, take a longer operating time prior to check.
(Criterion: Discharge temperature of TD1 and TD2 are 60°C or higher)

(*1)

a) Leakage check for SV3A valve (For multiple outdoor unit system)

- Turn off the power supply, take off connector of SV3A valve, and then start a test operation after power-ON.
- Check the temperature change at secondary side of SV3A valve during operation . (① in the figure.)
  → If temperature is raised, it is a leakage of SV3A valve. Replace SV3A valve.

b) Leakage check for SV3C valve

- Turn off the power supply, take off connector of SV3C valve, and then start a test operation after power-ON.
- After operation for several minutes, check temperature at secondary side of SV3C valve. (② in the figure.)
  → If temperature is high (equivalent to discharge temperature TD), it is a leakage of SV3C valve. Replace SV3C valve.
  (Even if there is leakage from SV3C valve does not occur, temperature of SV3C valve at secondary side rises during operation. When the checked temperature is equivalent to TD temperature, it is a leakage of SV3C valve. Replace SV3C valve.)

c) Clogging check for SV3B valve (For multiple outdoor unit system)

- While outdoor unit is operated, set up SW01/02/03 = [2] [1] [3] to 7-segment display [Hr] [2], and push SW04 for 2 seconds or more.
- Set up SW02 = [9], and turn on SV3A, SV3B, SV3C valves. (7-segment display [Hr] [3–])
- While outdoor unit is operating, check temperature change at secondary side of SV3B valve. (③ in the figure.)
  → If temperature does not rise (equivalent to suction temperature), it is a clogging of SV3B valve. Replace SV3B valve.

d) Clogging for SV3E valve

Reset the power supply.
⇩
Referring to “Valve forced open/close function” of the outdoor unit, check ON/OFF operation (Sound, coil surface temp up) of SV3E valve is performed.
⇩
Start test operation in COOL or HEAT mode.
⇩
After operation for several minutes, check the pipe temperature at the secondary side of SV3E valve whether temperature changes or not. If it is equivalent to outside temperature, clogging of SV3E is considered. (④ in the figure.)

(Reference)

If SV3E valve is clogged, temperature of all TK1, TK2, TK3, and TK4 do not change.

(*2) Clogging check for SV3D valve of oil return circuit from oil separator

a) Oil return circuit

- While outdoor unit is operating, check temperature (secondary side of capillary) on oil return circuit. (⑤ in the figure.)
  → If temperature is low equivalent to suction temperature), a clogging of strainer of oil return circuit or capillary is considered. Repair the clogged part.

b) Clogging check for SV3D valve

- While outdoor unit is operating, set up SW01/02/03 = [2] [1] [3] to 7-segment display [Hr] [2], and push SW04 for 2 seconds or more.
- Set up SW02 = [6], and turn on SV3D valve. (7-segment display [Hr] [3d])
- If temperature is low at secondary side of the valve or it does not change, clogging of valve, capillary, or strainer is considered. (⑥ in the figure.)

(*3) Check for solenoid valve of outdoor unit (For multiple outdoor unit system)

a) Clogging check for SV3A valve

- While outdoor unit is operating, set up SW01/02/03 = [2] [1] [3] to 7-segment display [Hr] [2], and push SW04 for 2 seconds or more.
- Set up SW02 = [4], and turn on SV3A valve. (7-segment display [Hr] [3A])
- If temperature is low at secondary side of the valve or it does not change, clogging of valve or check valve is considered. (① in the figure.)

b) Leakage check for SV3C valve

- While outdoor unit is operating, set up SW01/02/03 = [2] [1] [3] to 7-segment display [Hr] [2], and push SW04 for 2 seconds or more.
- Set up SW02 = [6], and turn on SV3C valve. (7-segment display [Hr] [3C])
- If temperature does not change (up), clogging of valve or strainer is considered. (② in the figure.)

(*4)

a) Clogging check for oil-equalization circuit

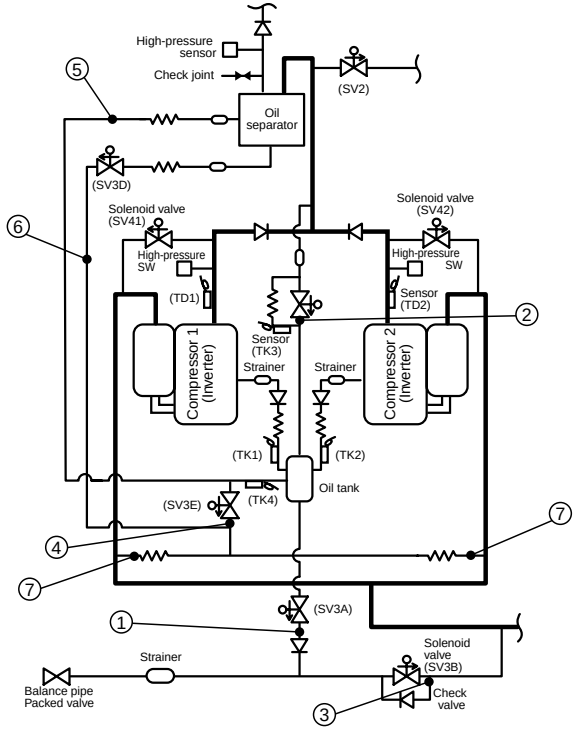
- Drive the outdoor unit. (Drive both compressors in the unit.)
- After driving for 10 minutes, check temperature of TK1 and TK2 sensors and temperature of oil-equalization circuit capillary (⑦ in the figure) were raised.

(Criterion)

TK1, TK2=Td1, Td2 temperature – Approx. 10 to 30°C

Oil-equalization capillary tubes should be higher sufficiently than outside air temperature and suction temperature.

- If temperature is low, a malfunction of capillary, strainer, or check valve is considered. Repair the defective parts.



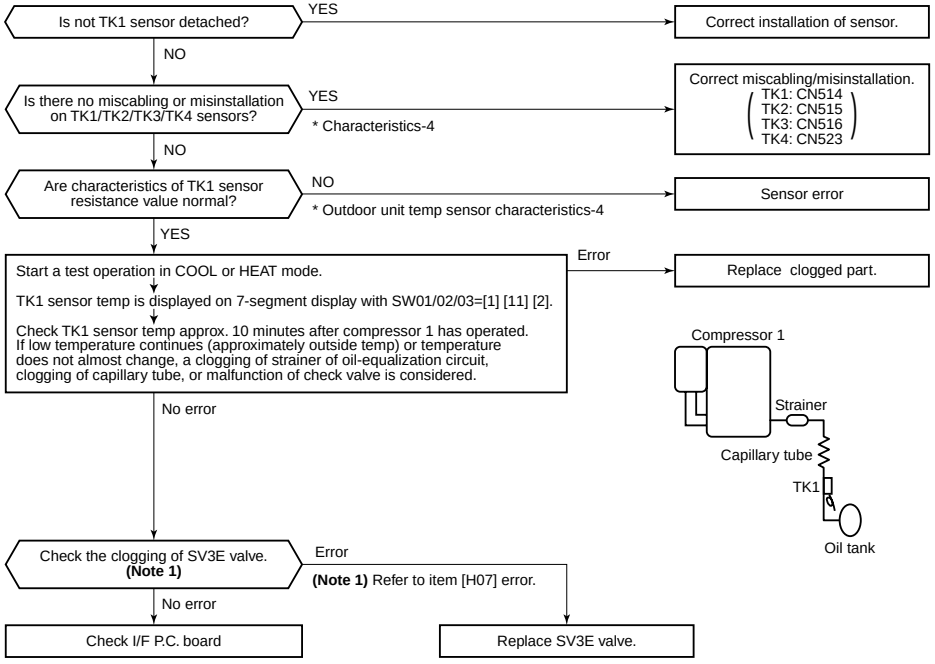
Check code name	Check code name	Cause of operation
[H08] / [d4] (d07 / AI-NET)	**Oil level detective temperature sensor error**	TK1 to TK4 sensor Open/Short

Sub-code: 01: TK1 sensor error 02: TK2 sensor error 03: TK3 sensor error 04: TK4 sensor error

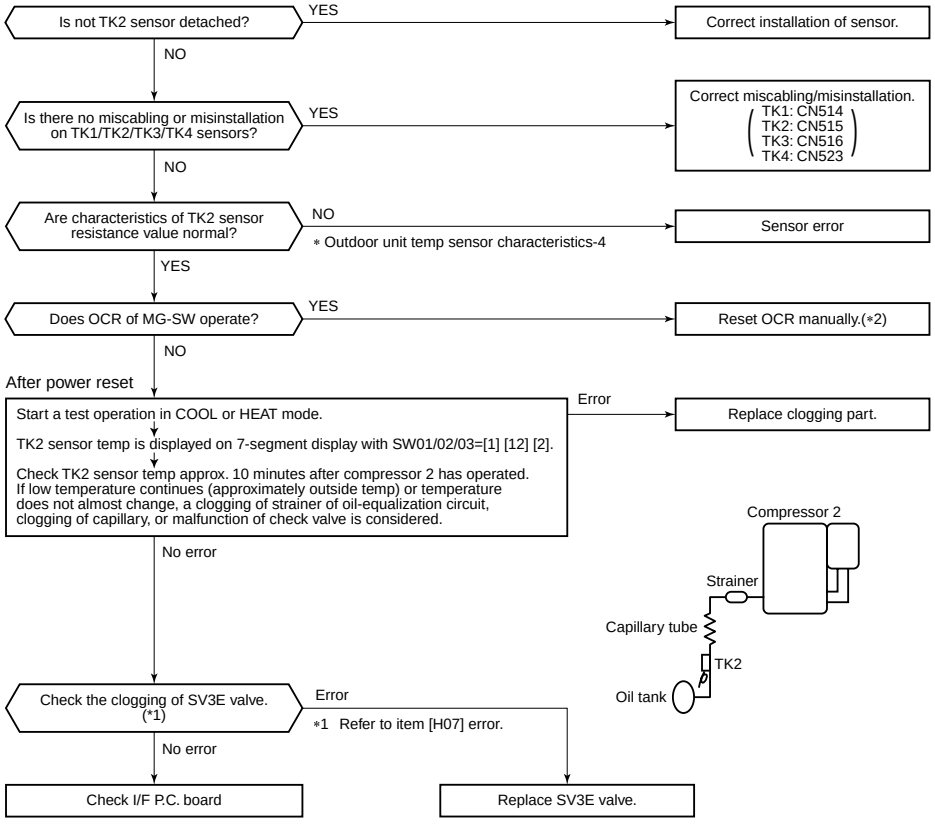
The detected error is an oil level detective temperature sensor error.
Check disconnection of the wiring and resistance value of the sensor.
If the sensors are normal, replace the outdoor I/F P.C. board.

Circuit	Connector
TK1	CN514 (Black)
TK2	CN515 (Green)
TK3	CN516 (Red)
TK4	CN523 (Yellow)

Check code name	Check code name	Cause of operation
[H16] / [d7] (d07 / AI-NET)	**TK1 temperature detective circuit error (Sub-code: 01)**	1. Coming-off of TK1 sensor, miscabling, characteristics error of resistance value 2. Oil-equalization circuit error (Check valve, capillary clogging, strainer clogging) 3. Refrigerant stagnation in case of compressor shell

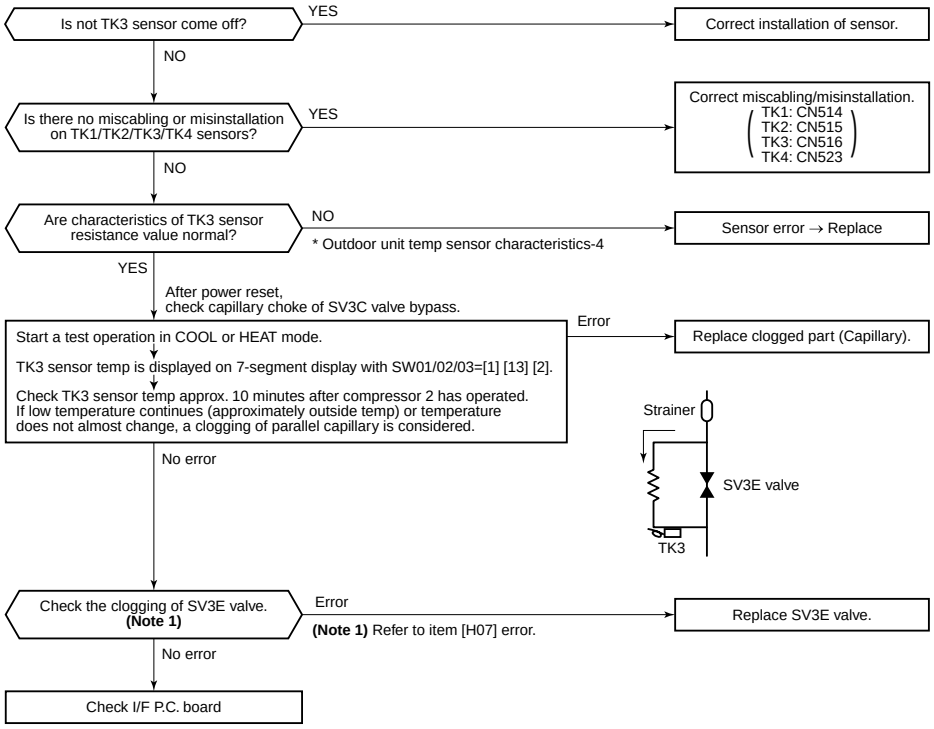

Is not TK1 sensor detached?
YES
Correct installation of sensor.
NO
Is there no miscabling or misinstallation on TK1/TK2/TK3/TK4 sensors?
YES
* Characteristics-4
Correct miscabling/misinstallation.
TK1: CN514
TK2: CN515
TK3: CN516
TK4: CN523
NO
Are characteristics of TK1 sensor resistance value normal?
NO
* Outdoor unit temp sensor characteristics-4
Sensor error
YES
Start a test operation in COOL or HEAT mode.
TK1 sensor temp is displayed on 7-segment display with SW01/02/03=[1] [11] [2].
Check TK1 sensor temp approx. 10 minutes after compressor 1 has operated.
If low temperature continues (approximately outside temp) or temperature does not almost change, a clogging of strainer of oil-equalization circuit, clogging of capillary tube, or malfunction of check valve is considered.
Error
Replace clogged part.
No error
Compressor 1
Strainer
Capillary tube
TK1
Oil tank
Check the clogging of SV3E valve. (Note 1)
Error
(Note 1) Refer to item [H07] error.
No error
Check I/F P.C. board
Replace SV3E valve.

Check code name	Check code name	Cause of operation
[H16] / [d7] (d07 / AI-NET)	**Oil level detective circuit system error (Sub-code: 02)**	1. Detachment of TK2 sensor, miscabling, characteristics error of resistance value 2. Oil-equalization circuit error (Check valve, capillary clogging, strainer clogging) 3. Refrigerant stagnation in compressor shell

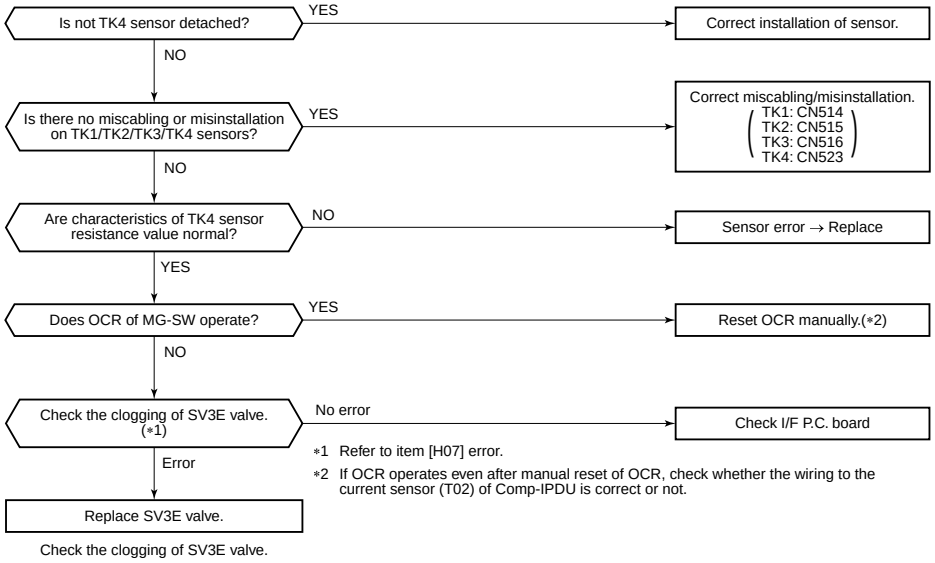

Is not TK2 sensor detached?
YES
Correct installation of sensor.
NO
Is there no miscabling or misinstallation on TK1/TK2/TK3/TK4 sensors?
YES
Correct miscabling/misinstallation.
TK1: CN514
TK2: CN515
TK3: CN516
TK4: CN523
NO
Are characteristics of TK2 sensor resistance value normal?
NO
Sensor error
* Outdoor unit temp sensor characteristics-4
YES
Does OCR of MG-SW operate?
YES
Reset OCR manually.(*2)
NO
After power reset
Start a test operation in COOL or HEAT mode.
TK2 sensor temp is displayed on 7-segment display with SW01/02/03=[1] [12] [2].
Check TK2 sensor temp approx. 10 minutes after compressor 2 has operated.
If low temperature continues (approximately outside temp) or temperature does not almost change, a clogging of strainer of oil-equalization circuit, clogging of capillary, or malfunction of check valve is considered.
Error
Replace clogging part.
No error
Check the clogging of SV3E valve. (*1)
Error
*1 Refer to item [H07] error.
No error
Check I/F P.C. board
Replace SV3E valve.
Compressor 2
Strainer
Capillary tube
TK2
Oil tank

*2 If OCR operates even after manual reset of OCR, check whether the wiring to the current sensor (T02) of Comp-IPDU is correct or not.

Check code name	Check code name	Cause of operation
[H16] / [d7] (d07 / AI-NET)	**TK3 temperature detective circuit error (Sub-code: 03)**	1. Detachment of TK3 sensor, miscabling, characteristics error of resistance value 2. Error of SV3C valve circuit periphery (Check capillary clogging, strainer clogging) 3. Refrigerant stagnation in compressor shell


Is not TK3 sensor come off?
YES
Correct installation of sensor.
NO
Is there no miscabling or misinstallation on TK1/TK2/TK3/TK4 sensors?
YES
Correct miscabling/misinstallation.
TK1: CN514
TK2: CN515
TK3: CN516
TK4: CN523
NO
Are characteristics of TK3 sensor resistance value normal?
NO
Sensor error → Replace
* Outdoor unit temp sensor characteristics-4
YES
After power reset, check capillary choke of SV3C valve bypass.
Start a test operation in COOL or HEAT mode.
TK3 sensor temp is displayed on 7-segment display with SW01/02/03=[1] [13] [2].
Check TK3 sensor temp approx. 10 minutes after compressor 2 has operated.
If low temperature continues (approximately outside temp) or temperature does not almost change, a clogging of parallel capillary is considered.
Error
Replace clogged part (Capillary).
No error
Check the clogging of SV3E valve. (Note 1)
Error
(Note 1) Refer to item [H07] error.
Replace SV3E valve.
No error
Check I/F P.C. board
Strainer
SV3E valve
TK3

Check code name	Check code name	Cause of operation
[H16] / [d7] (d07 / AI-NET)	**TK4 temperature detective circuit error (Sub-code: 04)**	1. Detachment of TK4 sensor, miscabling, characteristics error of resistance value 2. Check clogging and malfunction of SV3E valve circuit. 3. Oil-equalization circuit error (Check capillary clogging, strainer clogging) 4. Refrigerant stagnation in compressor shell



Check the clogging of SV3E valve.

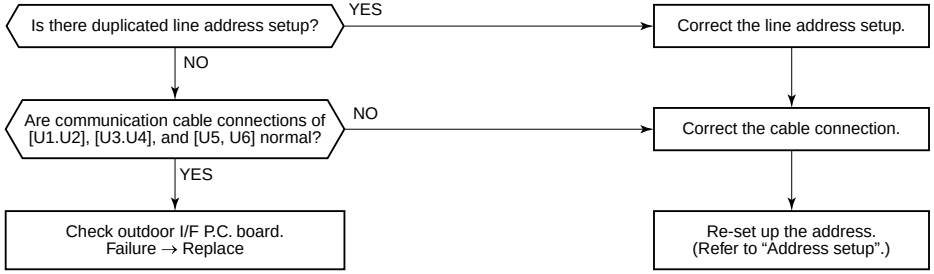
∗1 Refer to item [H07] error.

∗2 If OCR operates even after manual reset of OCR, check whether the wiring to the current sensor (T02) of Comp-IPDU is correct or not.

Check code name	Check code name	Cause of operation
[L03] / [96] (d07 / AI-NET)	**Duplicated indoor header units**	There were two or more indoor header units in some remote controller group control.

1) Check the connection changing of the remote controller after the connection has been changed.
2) If the group configuration and address are normal when power has been turned on, the mode automatically shifts to address setup mode. (Re-setup of address) → Refer to “Address setup”.

Check code name	Check code name	Cause of operation
[L04] / [96] (d07 / AI-NET)	**Duplicated setup of outdoor line address**	Outdoor line addresses are duplicated.



Check code name	Check code name	Cause of operation
[L05] / [96] (d07 / AI-NET)	**Duplicated indoor units with priority (Displayed on indoor unit with priority)**	1. Two or more prior indoor units exist.

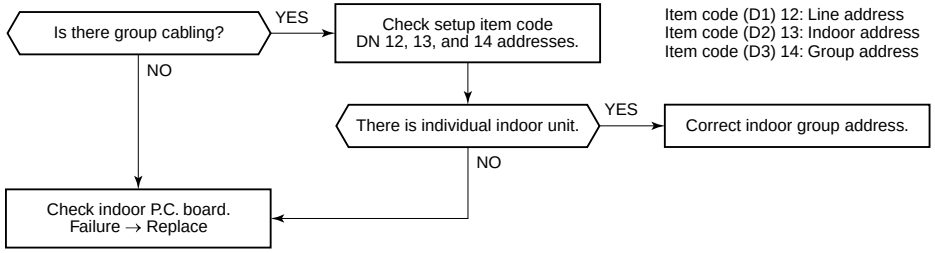
This check code is displayed on the set indoor unit when setup of indoor unit with priority is duplicated.
• Priority setup with two or more units is not available. Choose one prior unit in one refrigerant circuit system.

Check code name	Check code name	Cause of operation
[L06] / [96] (d07 / AI-NET)	**Duplicated indoor units with priority (Displayed on the indoor unit other than one with priority and on the outdoor unit)**	Two or more indoor units with priority are duplicated.

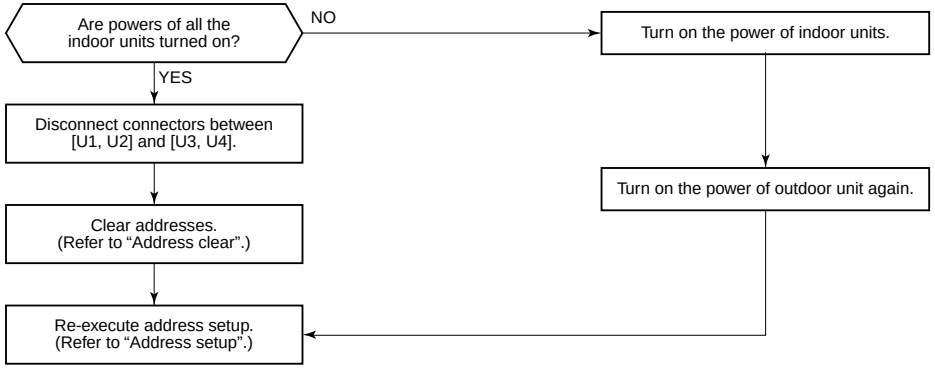
Sub-code: No. of indoor units with priority

When indoor unit with priority is duplicated, this check code is displayed on the unit other than the setup indoor unit and outdoor unit.
• As only one indoor unit with priority is valid, change the setup.

Check code name	Check code name	Cause of operation
[L07] / [99] (d07 / AI-NET)	**Group line in individual indoor unit**	The group line is connected in the individual indoor unit.

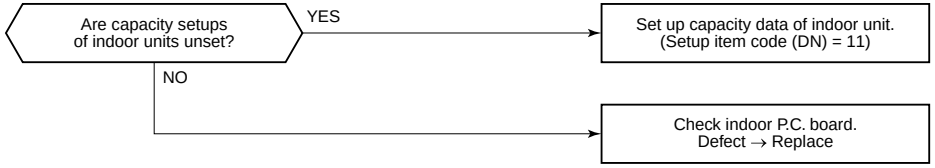

Is there group cabling?
YES
Check setup item code DN 12, 13, and 14 addresses.
NO
There is individual indoor unit.
YES
Correct indoor group address.
NO
Check indoor P.C. board. Failure → Replace
Item code (D1) 12: Line address
Item code (D2) 13: Indoor address
Item code (D3) 14: Group address

Check code name	Check code name	Cause of operation
[L08] / [99]* (d07 / AI-NET)	**Indoor group / address unset**	Indoor address unset


Are powers of all the indoor units turned on?
NO
Turn on the power of indoor units.
YES
Disconnect connectors between [U1, U2] and [U3, U4].
Turn on the power of outdoor unit again.
Clear addresses. (Refer to “Address clear”.)
Re-execute address setup. (Refer to “Address setup”.)

Note) This code is displayed when the power is turned on at the first time after installation. (Because the address is not yet set up)

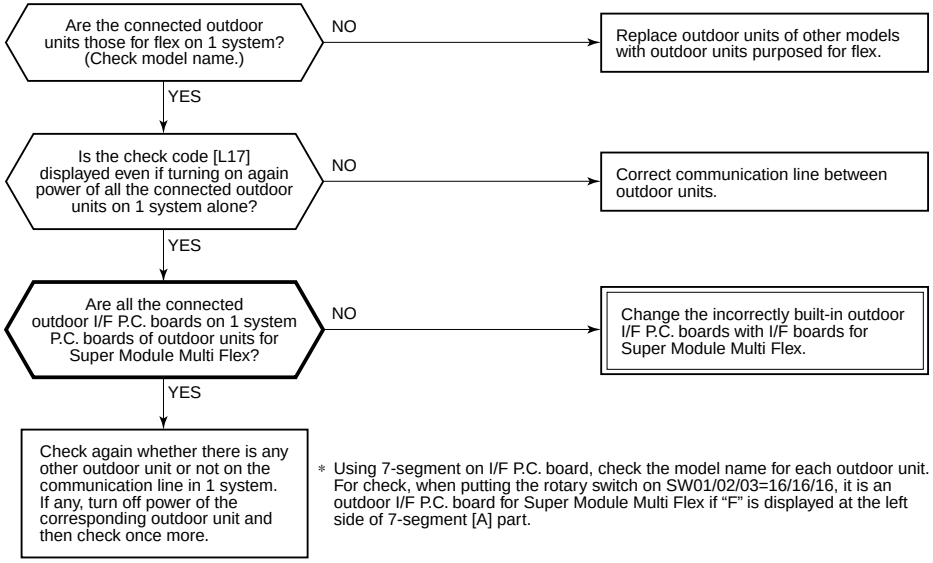
Check code name	Check code name	Cause of operation
[L09] / [46] (d07 / AI-NET)	**Indoor capacity unset**	Indoor capacity unset


Are capacity setups of indoor units unset?
YES
Set up capacity data of indoor unit. (Setup item code (DN) = 11)
NO
Check indoor P.C. board. Defect → Replace

Check code name	Check code name	Cause of operation
[L10] / [88] (d07 / AI-NET)	**Outdoor capacity unset**	On the outdoor IF P.C. board for service, the model selecting jumper has not been set up so as to match with the model.

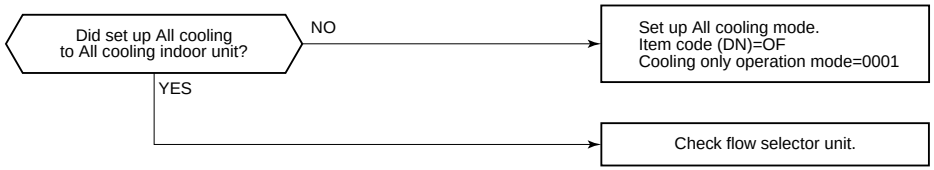
I/F P.C. board A'ssy service for the outdoor unit is common to this series. A setup for model selection different from that for P.C. board with trouble is necessary. Set up a model based upon the P.C. board A'ssy exchange procedure.

Check code name	Check code name	Cause of operation
[L17] / [46] (d07 / AI-NET)	**Inconsistent models of outdoor units**	There are outdoor units on the communication line other than Super Module Multi Flex type such as Super Module Multi or Super Module Multi ice regenerative type

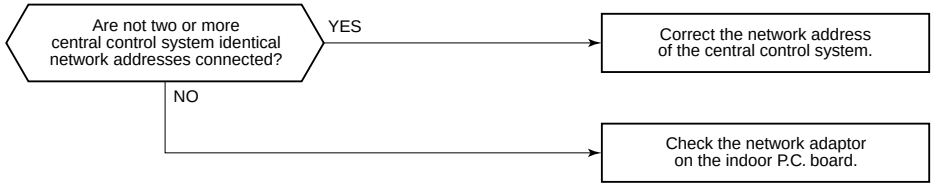

Are the connected outdoor units those for flex on 1 system? (Check model name.)
NO
Replace outdoor units of other models with outdoor units purposed for flex.
YES
Is the check code [L17] displayed even if turning on again power of all the connected outdoor units on 1 system alone?
NO
Correct communication line between outdoor units.
YES
Are all the connected outdoor I/F P.C. boards on 1 system P.C. boards of outdoor units for Super Module Multi Flex?
NO
Change the incorrectly built-in outdoor I/F P.C. boards with I/F boards for Super Module Multi Flex.
YES
Check again whether there is any other outdoor unit or not on the communication line in 1 system. If any, turn off power of the corresponding outdoor unit and then check once more.

* Using 7-segment on I/F P.C. board, check the model name for each outdoor unit. For check, when putting the rotary switch on SW01/02/03=16/16/16, it is an outdoor I/F P.C. board for Super Module Multi Flex if “F” is displayed at the left side of 7-segment [A] part.

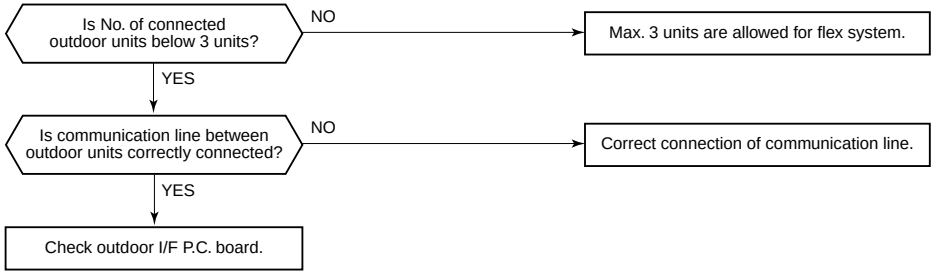
Check code name	Check code name	Cause of operation
[L18] / [8A] (d07 / AI-NET)	**Flow selector unit system error**	An indoor unit which has been operated in cooling only mode is operated in heating mode without setup for cooling only mode.


Did set up All cooling to All cooling indoor unit?
NO
Set up All cooling mode.
Item code (DN)=OF
Cooling only operation mode=0001
YES
Check flow selector unit.

Check code name	Check code name	Cause of operation
[L20] / [98] (d07 / AI-NET)	**Duplicated central control addresses**	Central control addresses are duplicated.

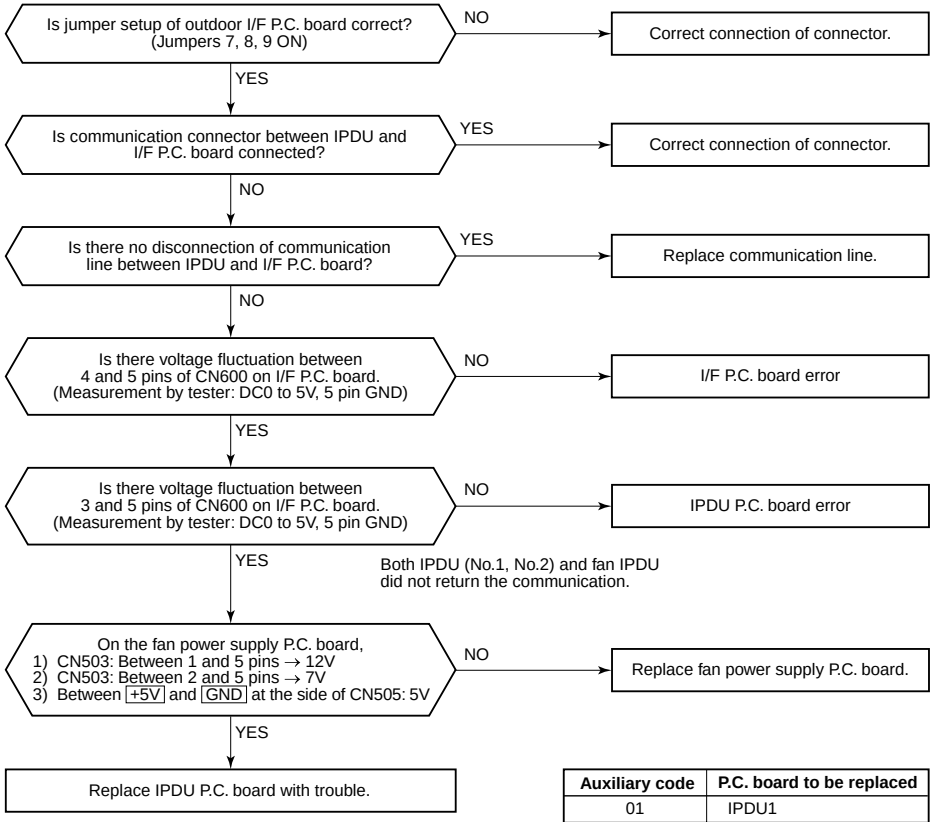

Are not two or more central control system identical network addresses connected?
YES
Correct the network address of the central control system.
NO
Check the network adaptor on the indoor P.C. board.

Check code name	Check code name	Cause of operation
[L28] / [46] (d07 / AI-NET)	**Quantity over of connected outdoor units**	1. Quantity over of connected outdoor units 2. Connection error of communication line between outdoor units 3. Outdoor I/F P.C. board error


Is No. of connected outdoor units below 3 units?
NO
Max. 3 units are allowed for flex system.
YES
Is communication line between outdoor units correctly connected?
NO
Correct connection of communication line.
YES
Check outdoor I/F P.C. board.

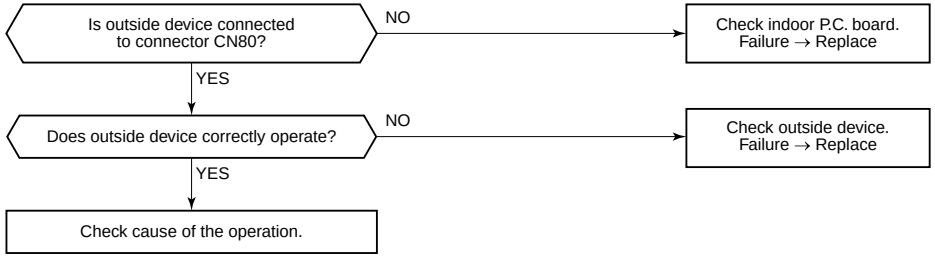
Check code name	Check code name	Cause of operation
[L29] / [CF] (d07 / AI-NET)	**IPDU quantity error**	1. Incorrect model setup in service for I/F P.C. board 2. Communication error between IPDU, fan IPDU and I/F 3. IPDU, fan IPDU, I/F P.C. board error

Sub-code:
01: IPDU1 error
02: IPDU2 error
03: IPDU1, 2 error
04: Fan IPDU error
05: IPDU1, fan IPDU error
06: IPDU2, fan IPDU error
07: All IPDU error or disconnection of communication line between IPDU-I/F P.C. board or outdoor I/F P.C. board error

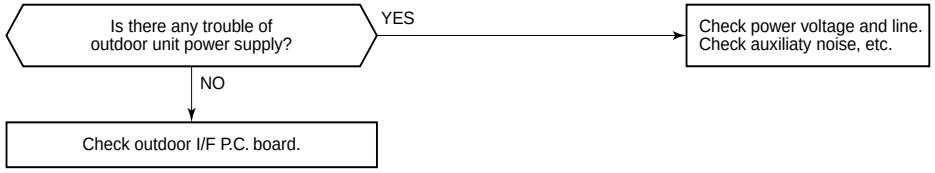

Is jumper setup of outdoor I/F P.C. board correct? (Jumpers 7, 8, 9 ON)
NO
Correct connection of connector.
YES
Is communication connector between IPDU and I/F P.C. board connected?
YES
Correct connection of connector.
NO
Is there no disconnection of communication line between IPDU and I/F P.C. board?
YES
Replace communication line.
NO
Is there voltage fluctuation between 4 and 5 pins of CN600 on I/F P.C. board. (Measurement by tester: DC0 to 5V, 5 pin GND)
NO
I/F P.C. board error
YES
Is there voltage fluctuation between 3 and 5 pins of CN600 on I/F P.C. board. (Measurement by tester: DC0 to 5V, 5 pin GND)
NO
IPDU P.C. board error
YES
Both IPDU (No.1, No.2) and fan IPDU did not return the communication.
On the fan power supply P.C. board,
1) CN503: Between 1 and 5 pins → 12V
2) CN503: Between 2 and 5 pins → 7V
3) Between +5V and GND at the side of CN505: 5V
NO
Replace fan power supply P.C. board.
YES
Replace IPDU P.C. board with trouble.

Auxiliary code	P.C. board to be replaced
01	IPDU1
02	IPDU2
03	IPDU1, 2
04	Fan IPDU
05	IPDU1, fan IPDU
06	IPDU2, fan IPDU
07	IPDU1, 2, fan IPDU, I/F

Check code name	Check code name	Cause of operation
[L30] / [b6] (d07 / AI-NET)	**Interlock in indoor unit from outside**	Outside error was input.

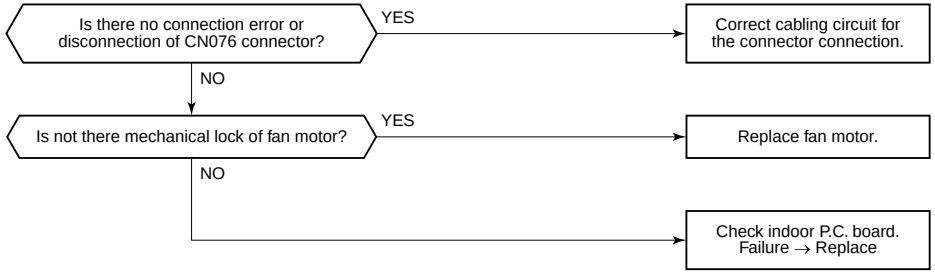


Check code name	Check code name	Cause of operation
[L31] / [–] (d07 / AI-NET)	**Extended IC error**	1. Outdoor unit power error 2. Outdoor I/F P.C. board error

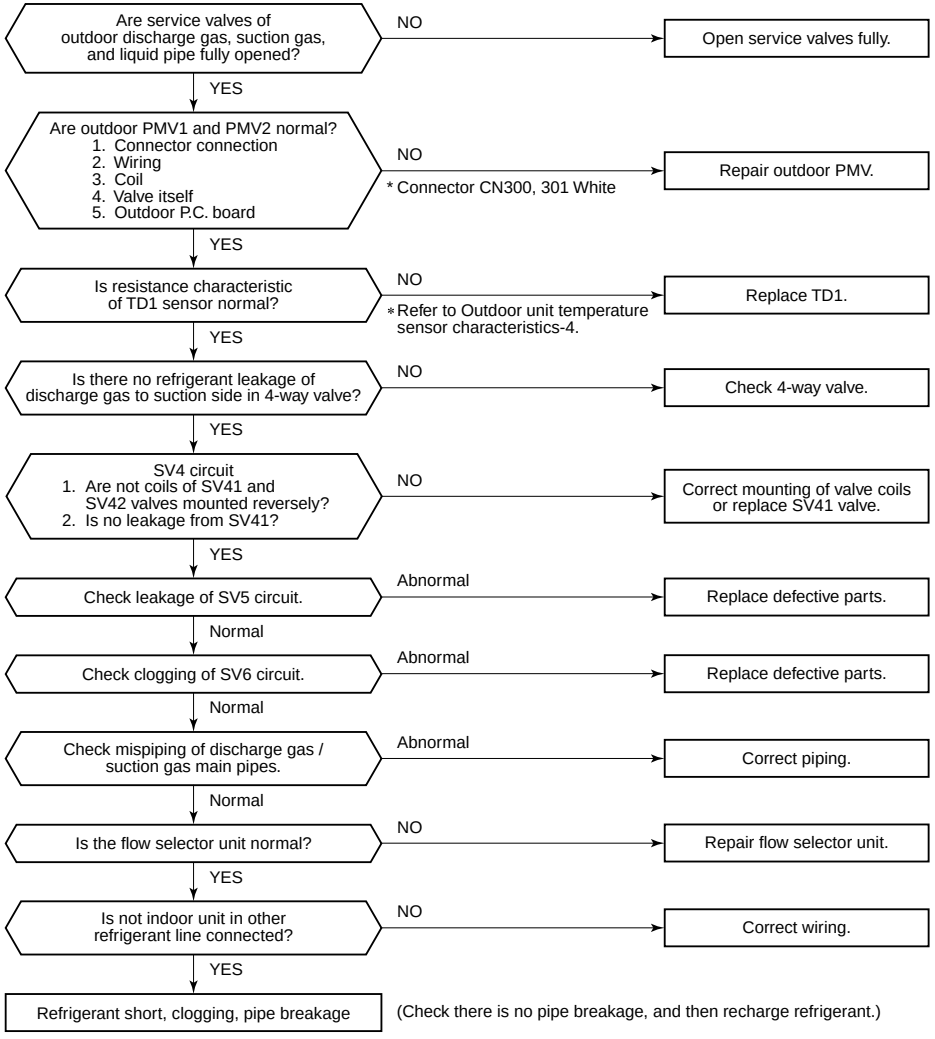

Is there any trouble of outdoor unit power supply?
YES
Check power voltage and line. Check auxiliaty noise, etc.
NO
Check outdoor I/F P.C. board.

Check code name	Check code name	Cause of operation
[P01] / [11] (d07 / AI-NET)	**Indoor fan motor error**	1. Cabling error 2. Check fan motor.

* For the models installed with AC fan motor only


Is there no connection error or disconnection of CN076 connector?
YES
Correct cabling circuit for the connector connection.
NO
Is not there mechanical lock of fan motor?
YES
Replace fan motor.
NO
Check indoor P.C. board. Failure → Replace

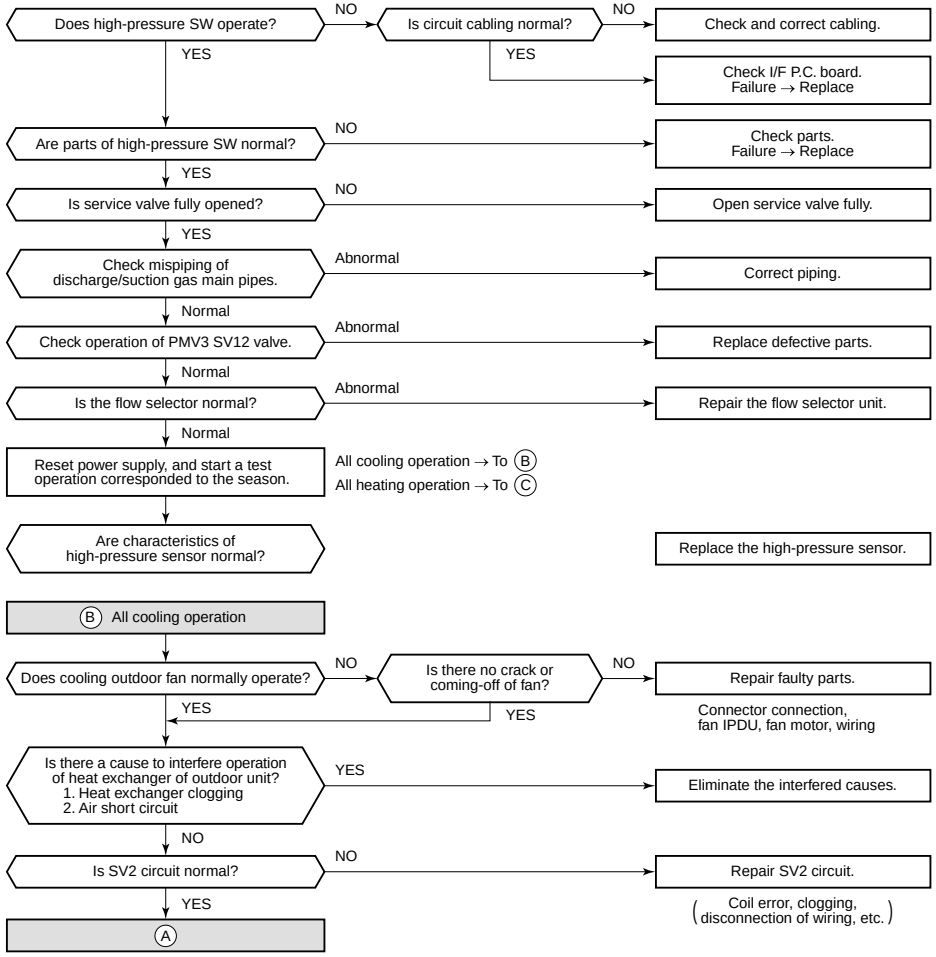
Check code name	Check code name	Cause of operation
[P03] / [1E] (d07 / AI-NET)	**Discharge temp TD1 error**	1. Service valve of outdoor unit closed. 2. Outdoor PMV1, 2 error 3. TD sensor error 4. Refrigerant short, clogging in pipe 5. 4-way valve error 6. SV4 circuit leakage, misinstallation 7. SV5 circuit leakage 8. SV6 circuit clogging 9. Discharge gas/Suction gas pipes mispiping 10. Flow selector unit error

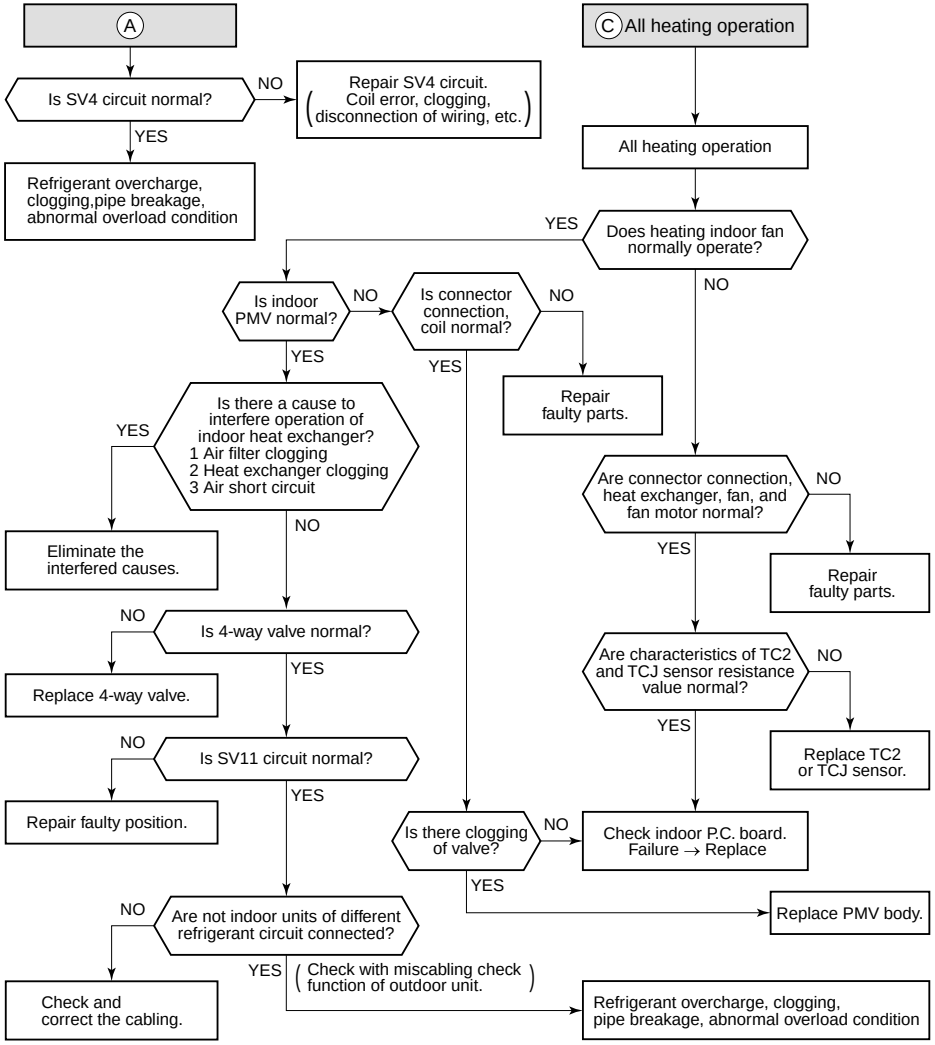


Check code name	Check code name	Cause of operation
[P04] / [21] (d07 / AI-NET)	**Actuation of high-pressure SW**	1. High-pressure SW error 2. Service valve closed 3. Pd sensor error 4. Indoor/outdoor fan error 5. Indoor/outdoor PMV choke 6. Indoor/outdoor heat exchanger clogging, air short circuit 7. SV2 circuit error 8. SV4 circuit error 9. SV5 circuit error 10. Discharge line check valve malfunction 11. Refrigerant overcharge

Sub-code: 01: Compressor 1 side 02: Compressor 2 side

Note) High-pressure SW is normally closed. (B contact)



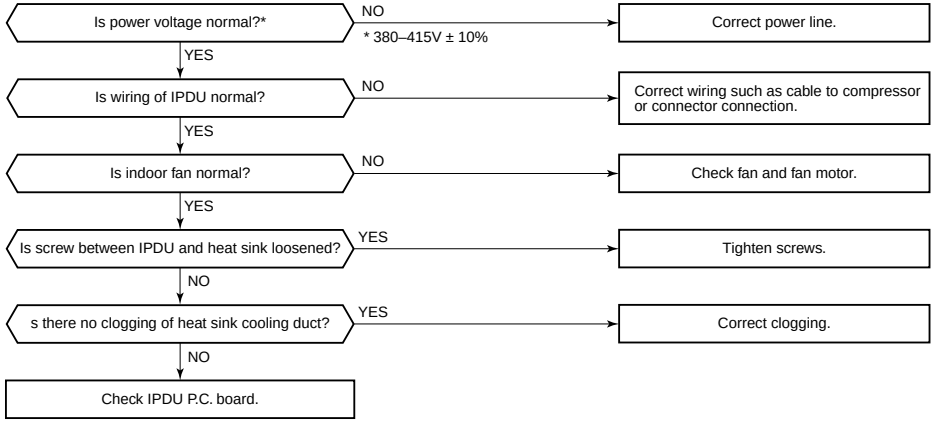


Check code name	Check code name	Cause of operation
[P05] / [AF] (d07 / AI-NET)	**Open phase, negative phase**	1. Power supply open phase 2. Power supply negative phase

- Check the phase power line of outdoor unit.
- Check error of outdoor I/F P.C. board.
- Check there is no looseness, etc of terminal.

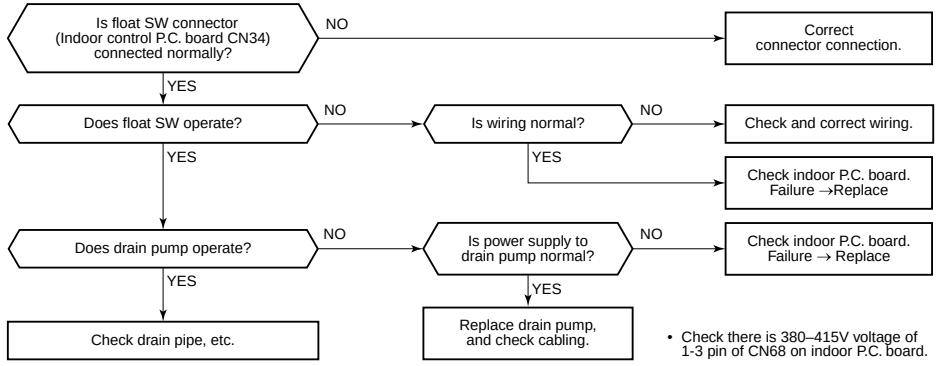
Check code name	Check code name	Cause of operation
[P07] / [1C] (d07 / AI-NET)	**Heat sink overheat error**	1. Power voltage error 2. Outdoor fan system error 3. Heat sink installation error 4. Clogging of hear sink cooling duct 5. IPDU P.C. board error (TH sensor error)

Sub-code: 01: Compressor 1 side 02: Compressor 2 side

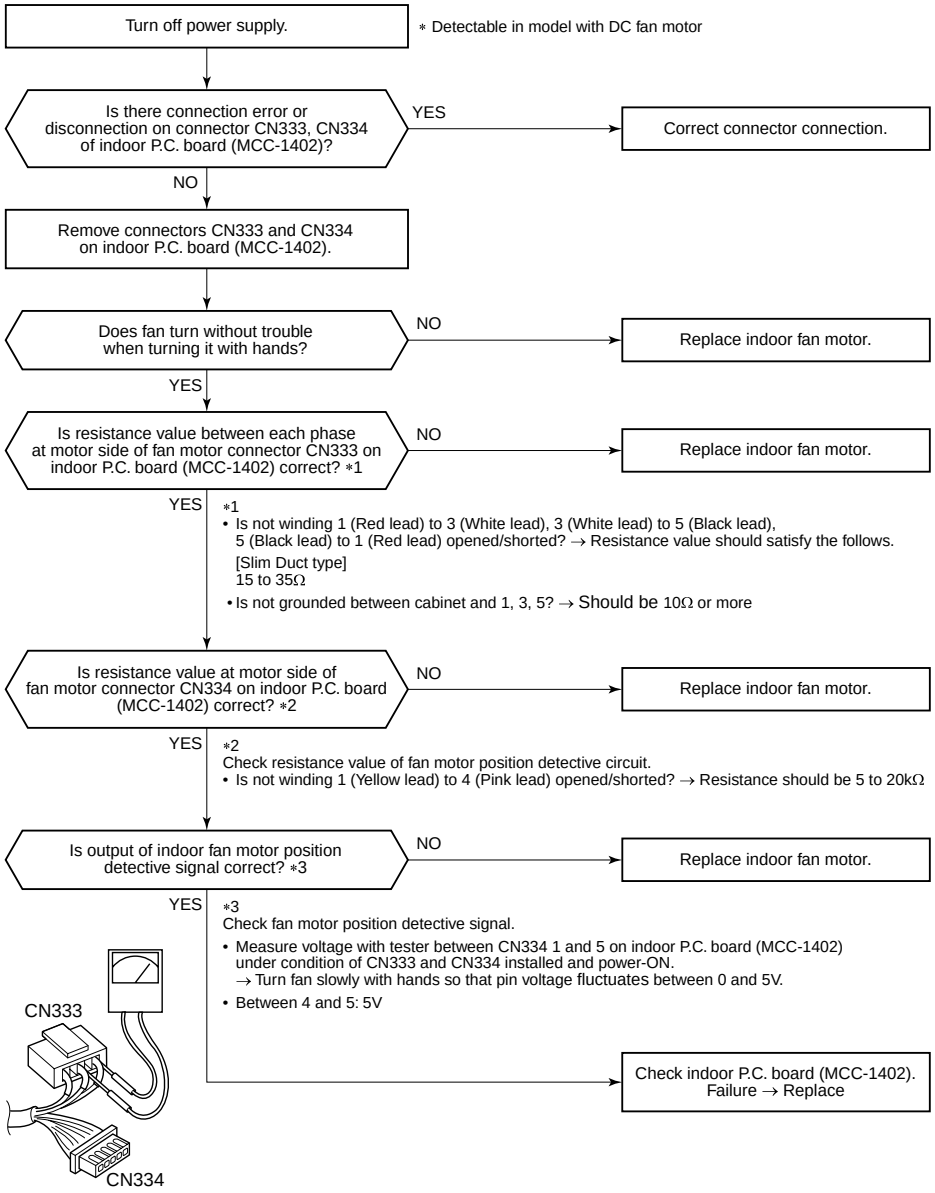


Check code name	Check code name	Cause of operation
[P10] / [0b] (d07 / AI-NET)	**Indoor overflow error**	1. Float SW operation error 2. Drain pump operation error 3. Clogging of drain pipe 4. Indoor P.C. board error

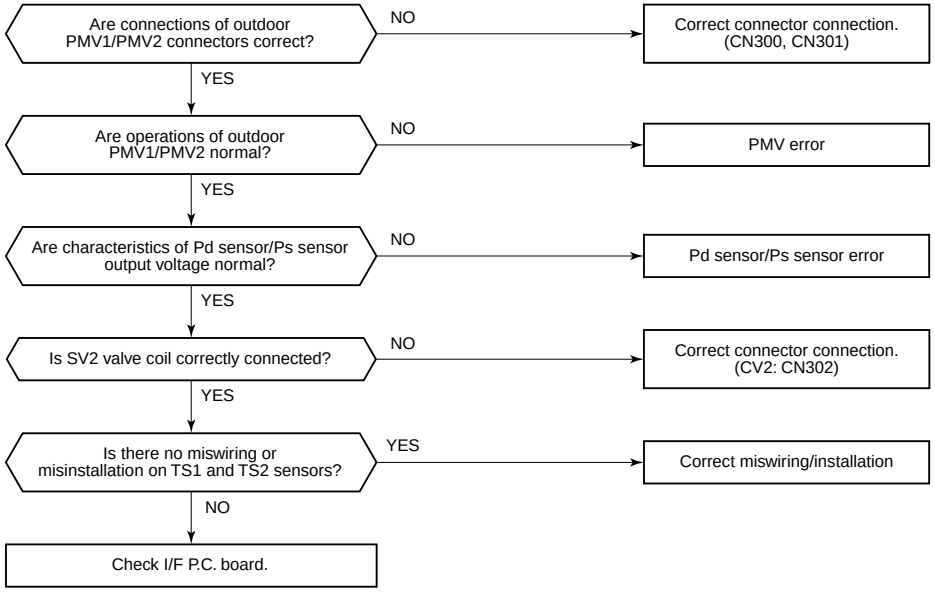
Sub-code: Indoor address with trouble



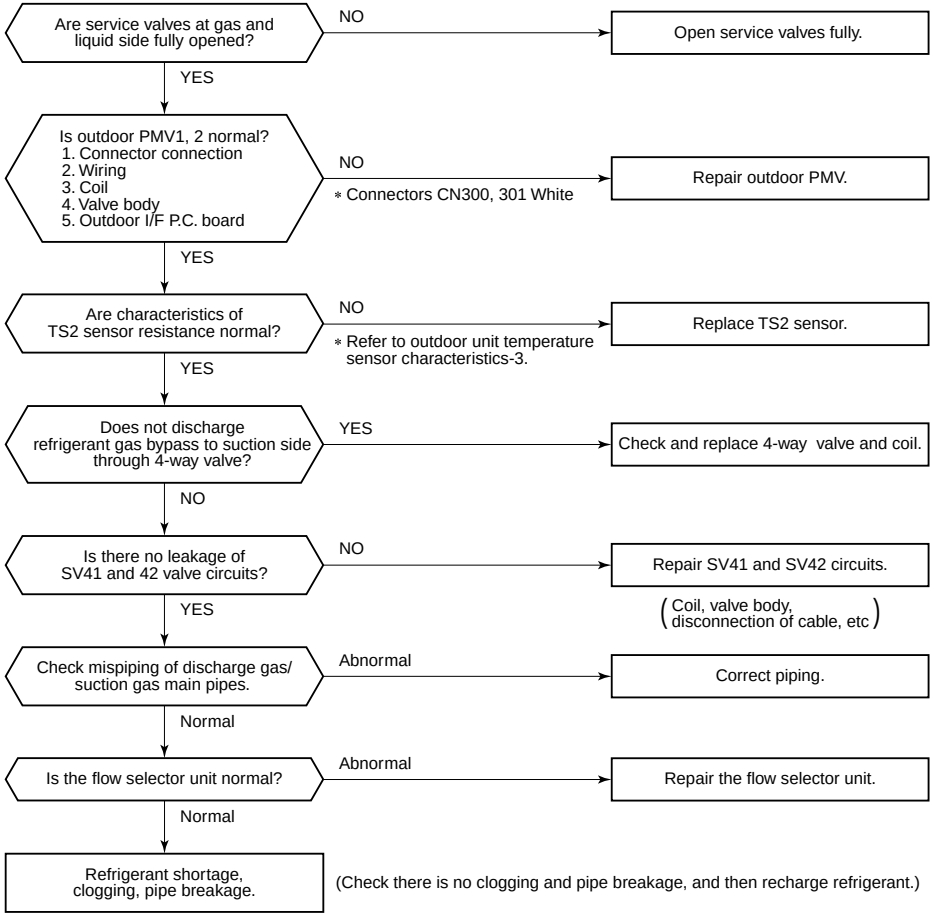
Check code name	Check code name	Cause of operation
[P12] / [11] (d07 / AI-NET)	**Indoor fan motor error**	1. Cabling error of fan motor connector 2. Fan motor error 3. Indoor P.C. board error


Turn off power supply.
∗ Detectable in model with DC fan motor
Is there connection error or disconnection on connector CN333, CN334 of indoor P.C. board (MCC-1402)?
YES
Correct connector connection.
NO
Remove connectors CN333 and CN334 on indoor P.C. board (MCC-1402).
Does fan turn without trouble when turning it with hands?
NO
Replace indoor fan motor.
YES
Is resistance value between each phase at motor side of fan motor connector CN333 on indoor P.C. board (MCC-1402) correct? ∗1
NO
Replace indoor fan motor.
YES
∗1
• Is not winding 1 (Red lead) to 3 (White lead), 3 (White lead) to 5 (Black lead), 5 (Black lead) to 1 (Red lead) opened/shorted? → Resistance value should satisfy the follows.
[Slim Duct type]
15 to 35Ω
• Is not grounded between cabinet and 1, 3, 5? → Should be 10Ω or more
Is resistance value at motor side of fan motor connector CN334 on indoor P.C. board (MCC-1402) correct? ∗2
NO
Replace indoor fan motor.
YES
∗2
Check resistance value of fan motor position detective circuit.
• Is not winding 1 (Yellow lead) to 4 (Pink lead) opened/shorted? → Resistance should be 5 to 20kΩ
Is output of indoor fan motor position detective signal correct? ∗3
NO
Replace indoor fan motor.
YES
∗3
Check fan motor position detective signal.
• Measure voltage with tester between CN334 1 and 5 on indoor P.C. board (MCC-1402) under condition of CN333 and CN334 installed and power-ON.
→ Turn fan slowly with hands so that pin voltage fluctuates between 0 and 5V.
• Between 4 and 5: 5V
CN333
CN334
Check indoor P.C. board (MCC-1402). Failure → Replace

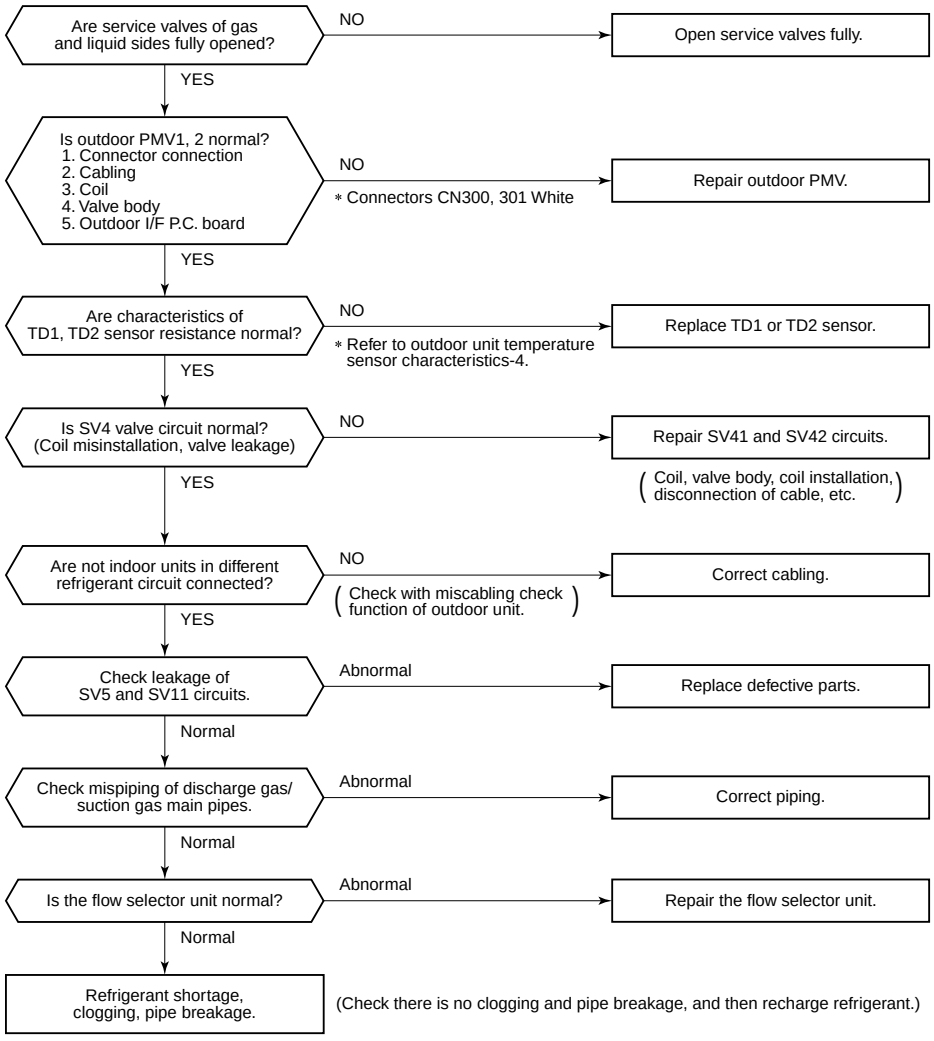
Check code name	Check code name	Cause of operation
[P13] / [47] (d07 / AI-NET)	**Outdoor liquid back detection error**	1. PMV1/PMV2 error 2. Pd sensor, Ps sensor error 3. Clogging of SV2 circuit 4. Clogging of SV3B circuit, balance pipe 5. Leakage of main discharge pipe 6. Outdoor I/F P.C. board error



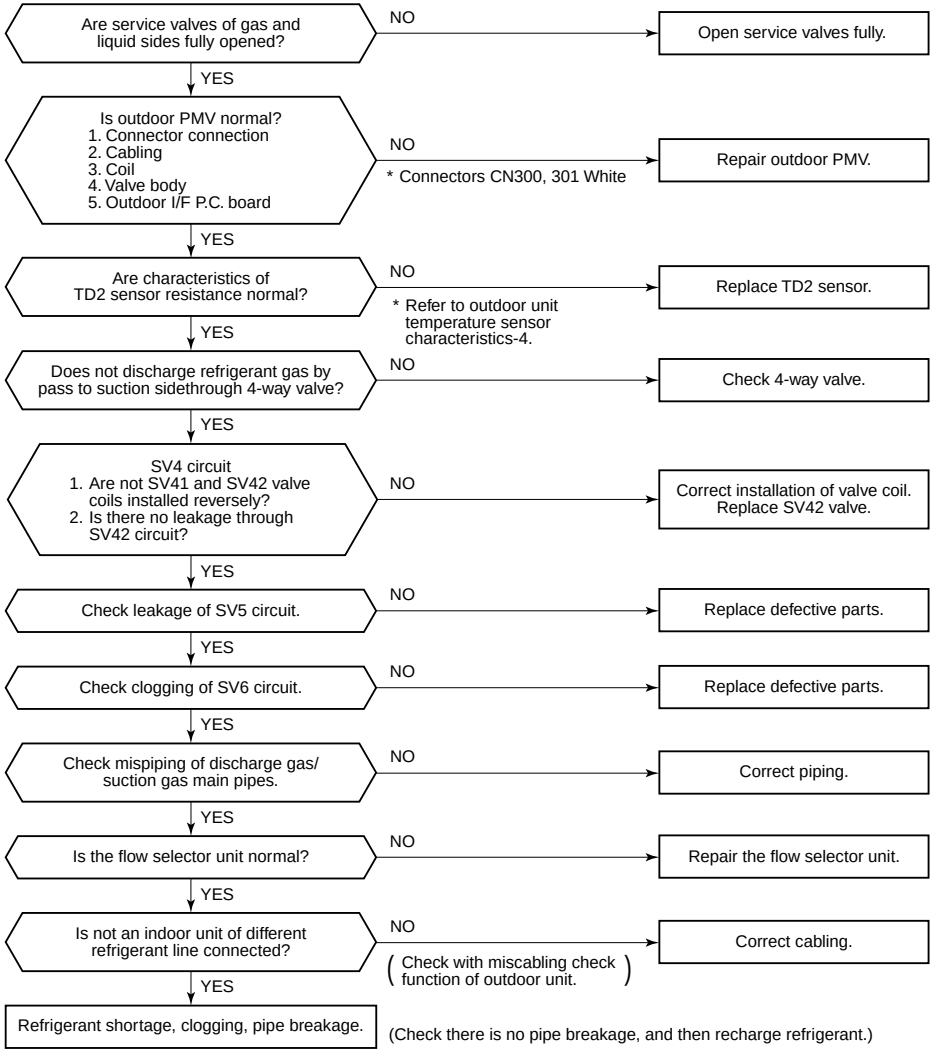
Check code name	Check code name	Cause of operation
[P15] / [AE] (d07 / AI-NET)	**Gas leak detection** **TS condition (Sub-code: 01)**	1. Outdoor unit service valve closed 2. Outdoor PMV error 3. TS1 sensor error 4. Refrigerant shortage, clogging refrigerant circuit 5. 4-way valve error 6. SV4 circuit error


Are service valves at gas and liquid side fully opened?
NO
Open service valves fully.
YES
Is outdoor PMV1, 2 normal?
1. Connector connection
2. Wiring
3. Coil
4. Valve body
5. Outdoor I/F P.C. board
NO
* Connectors CN300, 301 White
Repair outdoor PMV.
YES
Are characteristics of TS2 sensor resistance normal?
NO
* Refer to outdoor unit temperature sensor characteristics-3.
Replace TS2 sensor.
YES
Does not discharge refrigerant gas bypass to suction side through 4-way valve?
YES
Check and replace 4-way valve and coil.
NO
Is there no leakage of SV41 and 42 valve circuits?
NO
Repair SV41 and SV42 circuits.
(Coil, valve body, disconnection of cable, etc)
YES
Check mispiping of discharge gas/ suction gas main pipes.
Abnormal
Correct piping.
Normal
Is the flow selector unit normal?
Abnormal
Repair the flow selector unit.
Normal
Refrigerant shortage, clogging, pipe breakage.
(Check there is no clogging and pipe breakage, and then recharge refrigerant.)

Check code name	Check code name	Cause of operation
[P15] / [AE] (d07 / AI-NET)	**Gas leak detection** **TD condition (Sub-code: 02)**	1. Outdoor unit service valve closed 2. Outdoor PMV error 3. TD sensor error 4. SV4 circuit error 5. Refrigerant shortage, clogging refrigerant circuit

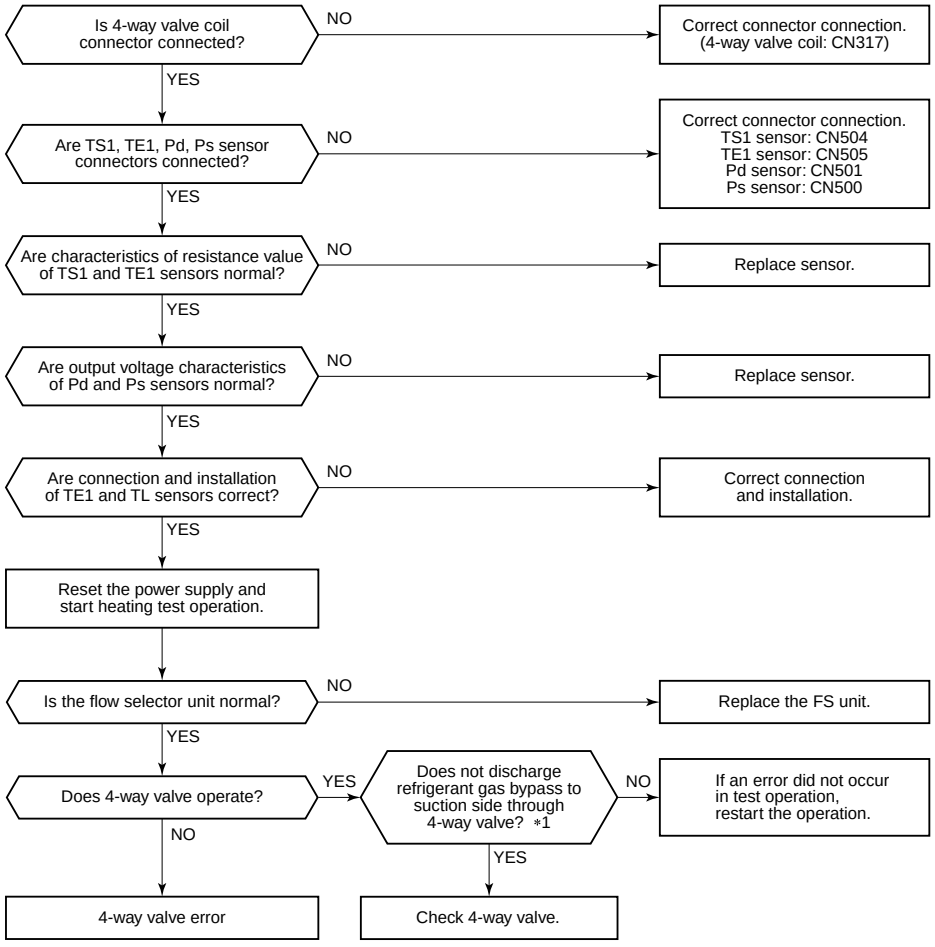

Are service valves of gas and liquid sides fully opened?
NO
Open service valves fully.
YES
Is outdoor PMV1, 2 normal?
1. Connector connection
2. Cabling
3. Coil
4. Valve body
5. Outdoor I/F P.C. board
NO
* Connectors CN300, 301 White
Repair outdoor PMV.
YES
Are characteristics of TD1, TD2 sensor resistance normal?
NO
* Refer to outdoor unit temperature sensor characteristics-4.
Replace TD1 or TD2 sensor.
YES
Is SV4 valve circuit normal? (Coil misinstallation, valve leakage)
NO
Repair SV41 and SV42 circuits.
(Coil, valve body, coil installation, disconnection of cable, etc.)
YES
Are not indoor units in different refrigerant circuit connected?
NO
(Check with miscabling check function of outdoor unit.)
Correct cabling.
YES
Check leakage of SV5 and SV11 circuits.
Abnormal
Replace defective parts.
Normal
Check mispiping of discharge gas/ suction gas main pipes.
Abnormal
Correct piping.
Normal
Is the flow selector unit normal?
Abnormal
Repair the flow selector unit.
Normal
Refrigerant shortage, clogging, pipe breakage.
(Check there is no clogging and pipe breakage, and then recharge refrigerant.)

Check code name	Check code name	Cause of operation
[P17] / [bb] (d07 / AI-NET)	**Discharge temp TD2 error**	1. Outdoor unit service valve closed 2. Outdoor PMV error 3. TD sensor error 4. Refrigerant shortage, clogging of refrigerant circuit 5. 4-way valve error 6. SV4 circuit leakage, misinstallation 7. SV5 circuit leakage 8. SV6 circuit clogging 9. Mispiping of discharge gas/suction gas pipes 10. Flow selector unit error



Check code name	Check code name	Cause of operation
[P19] / [08] (d07 / AI-NET)	**4-way valve operation error**	1. 4-way valve error 2. TS1 sensor/TE1 sensor error 3. Pd sensor/Ps sensor error 4. TE sensor/TL sensor misconnection

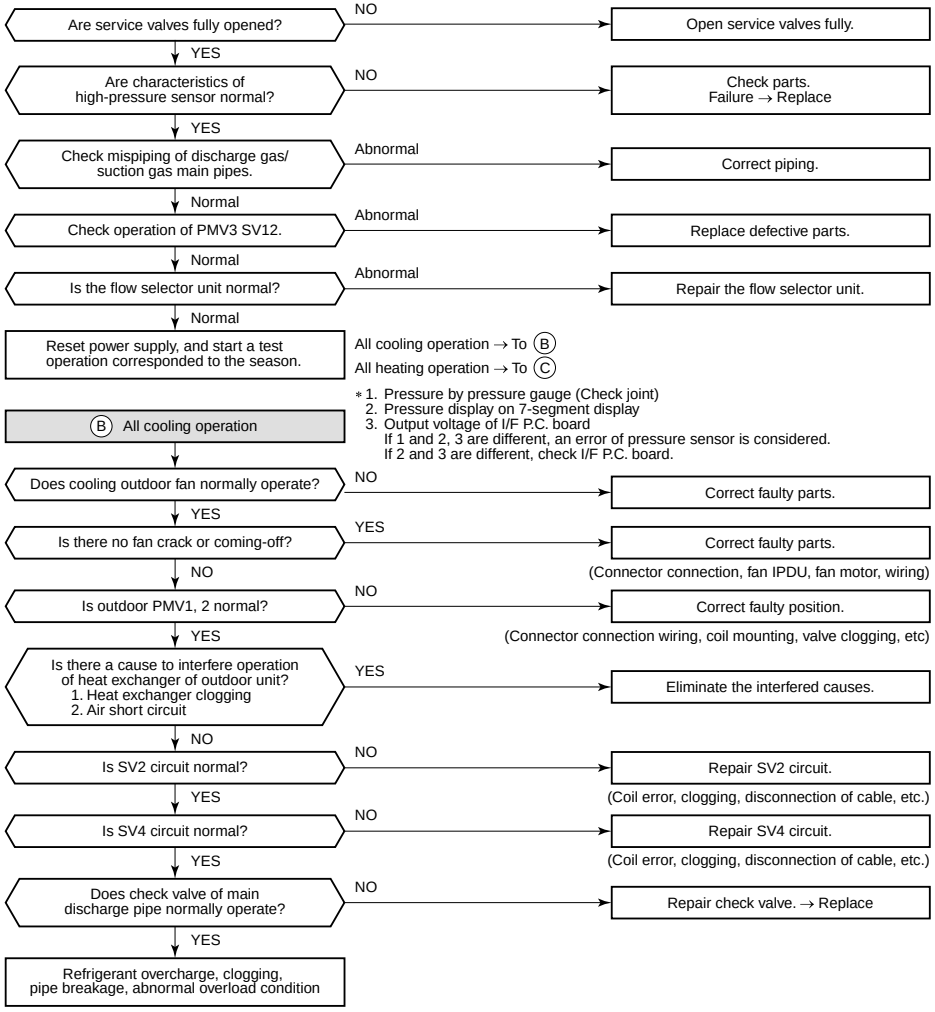
Sub-code: Detected outdoor unit No.

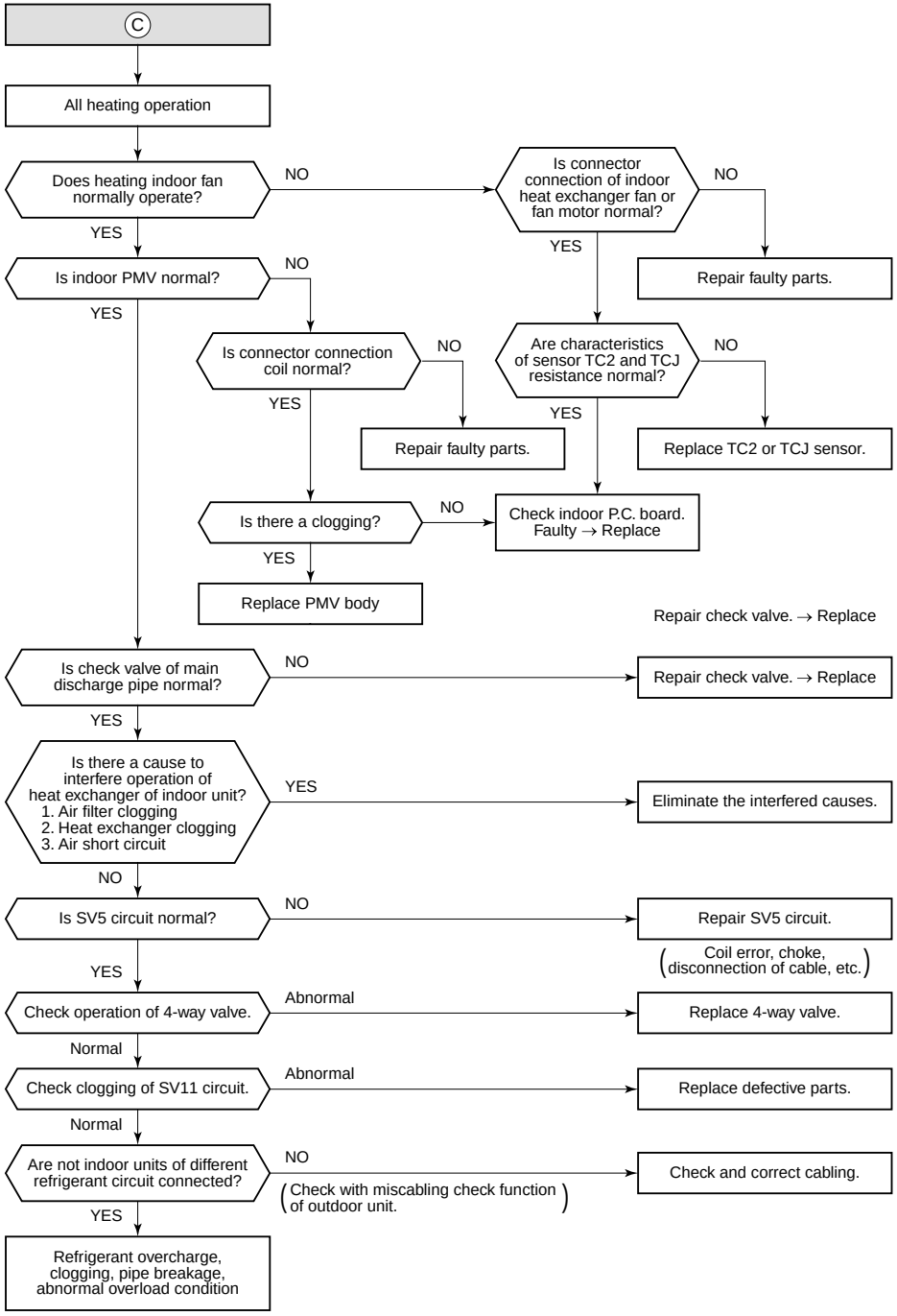

Is 4-way valve coil connector connected?
NO
Correct connector connection. (4-way valve coil: CN317)
YES
Are TS1, TE1, Pd, Ps sensor connectors connected?
NO
Correct connector connection. TS1 sensor: CN504 TE1 sensor: CN505 Pd sensor: CN501 Ps sensor: CN500
YES
Are characteristics of resistance value of TS1 and TE1 sensors normal?
NO
Replace sensor.
YES
Are output voltage characteristics of Pd and Ps sensors normal?
NO
Replace sensor.
YES
Are connection and installation of TE1 and TL sensors correct?
NO
Correct connection and installation.
YES
Reset the power supply and start heating test operation.
Is the flow selector unit normal?
NO
Replace the FS unit.
YES
Does 4-way valve operate?
YES
Does not discharge refrigerant gas bypass to suction side through 4-way valve? *1
NO
If an error did not occur in test operation, restart the operation.
NO
YES
4-way valve error
Check 4-way valve.

*1 Check TS and TE temperature of the outdoor unit which compressors is operated.
(I/F) SW01=[1], SW02=[6], SW03=[2] → TS sensor temperature
SW01=[1], SW02=[7], SW03=[2] → TE sensor temperature

<Judgment criteria>
TE sensor: Normal if TE £ 20˚C except summer season (Outside temp 20˚C or lower)
TS sensor: Normal if TS £ 40˚C except summer season (Outside temp 20˚C or lower)

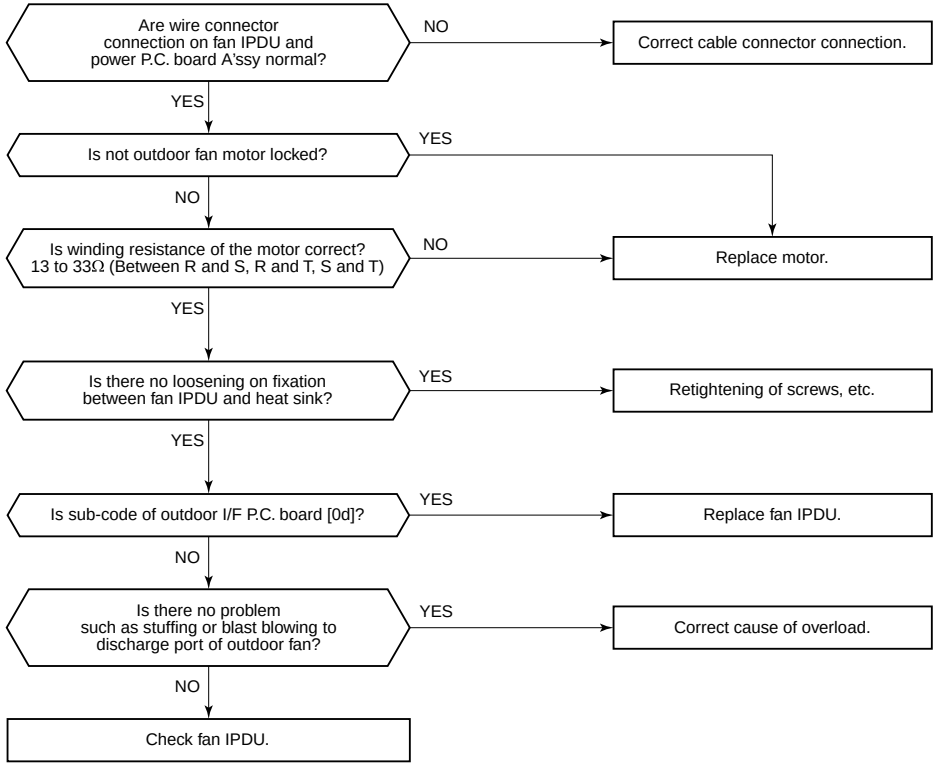
Check code name	Check code name	Cause of operation
[P20] / [22] (d07 / AI-NET)	**High-pressure protective operation**	1. Pd sensor error 2. Service valve closed. 3. Indoor/outdoor fan error 4. Indoor/outdoor PMV clogging 5. Indoor/outdoor heat exchanger clogging 6. SV2 circuit error 7. SV4 circuit error 8. SV5 circuit error 9. Outdoor I/F P.C. board error 10. Operation error of check valve of main discharge pipe 11. Refrigerant overcharge


Are service valves fully opened?
NO
Open service valves fully.
YES
Are characteristics of high-pressure sensor normal?
NO
Check parts. Failure → Replace
YES
Check mispiping of discharge gas/ suction gas main pipes.
Abnormal
Correct piping.
Normal
Check operation of PMV3 SV12.
Abnormal
Replace defective parts.
Normal
Is the flow selector unit normal?
Abnormal
Repair the flow selector unit.
Normal
Reset power supply, and start a test operation corresponded to the season.
All cooling operation → To (B)
All heating operation → To (C)
*1. Pressure by pressure gauge (Check joint)
2. Pressure display on 7-segment display
3. Output voltage of I/F P.C. board
If 1 and 2, 3 are different, an error of pressure sensor is considered.
If 2 and 3 are different, check I/F P.C. board.
(B) All cooling operation
Does cooling outdoor fan normally operate?
NO
Correct faulty parts.
YES
Is there no fan crack or coming-off?
YES
Correct faulty parts.
(Connector connection, fan IPDU, fan motor, wiring)
NO
Is outdoor PMV1, 2 normal?
NO
Correct faulty position.
(Connector connection wiring, coil mounting, valve clogging, etc)
YES
Is there a cause to interfere operation of heat exchanger of outdoor unit?
1. Heat exchanger clogging
2. Air short circuit
YES
Eliminate the interfered causes.
NO
Is SV2 circuit normal?
NO
Repair SV2 circuit.
(Coil error, clogging, disconnection of cable, etc.)
YES
Is SV4 circuit normal?
NO
Repair SV4 circuit.
(Coil error, clogging, disconnection of cable, etc.)
YES
Does check valve of main discharge pipe normally operate?
NO
Repair check valve. → Replace
YES
Refrigerant overcharge, clogging, pipe breakage, abnormal overload condition



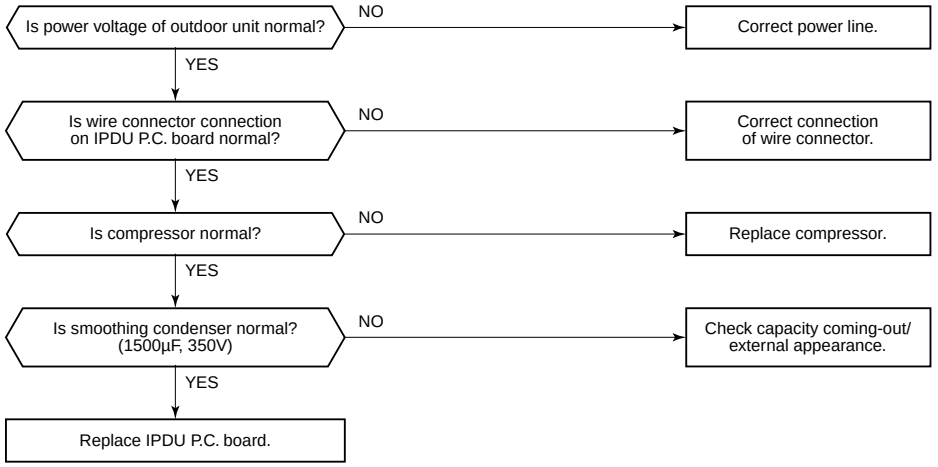
Check code name	Check code name	Cause of operation
[P22] / [1A] (d07 / AI-NET)	**Outdoor fan IPDU error**	1. Fan lock 2. Fan IPDU P.C. board error 3. Overload cause 4. External cause such as blast 5. Fan IPDU power P.C. board error

Sub-code:
- 0∗ : IGBT short circuit
- 1∗ : Position detect circuit error
- 3∗ : Motor lock error
- 4∗ : Motor current error detected
- C∗ : TH sensor error (Heat sink overheat)
- D∗ : TH sensor error
- E∗ : Vdc error


Are wire connector connection on fan IPDU and power P.C. board A'ssy normal?
NO
Correct cable connector connection.
YES
Is not outdoor fan motor locked?
YES
NO
Is winding resistance of the motor correct? 13 to 33Ω (Between R and S, R and T, S and T)
NO
Replace motor.
YES
Is there no loosening on fixation between fan IPDU and heat sink?
YES
Retightening of screws, etc.
YES
Is sub-code of outdoor I/F P.C. board [0d]?
YES
Replace fan IPDU.
NO
Is there no problem such as stuffing or blast blowing to discharge port of outdoor fan?
YES
Correct cause of overload.
NO
Check fan IPDU.

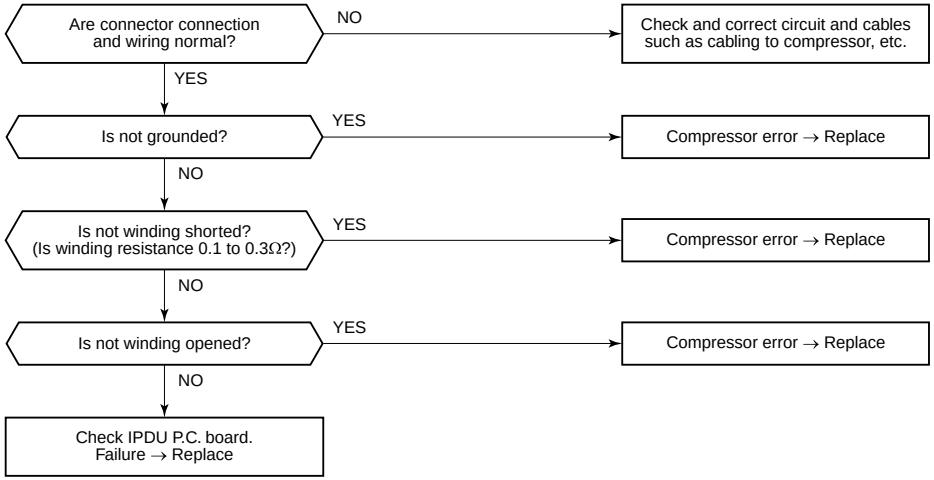
Check code name	Check code name	Cause of operation
[P26] / [14] (d07 / AI-NET)	**G-Tr short-circuit protection error**	1. Outdoor unit power error 2. IPDU error/Cable connection error 3. Compressor error 4. IPDU P.C. board error

Sub-code: 01: Compressor 1 side 02: Compressor 2 side



Check code name	Check code name	Cause of operation
[P29] / [16] (d07 / AI-NET)	**Compressor position detective circuit error**	1) Cable/connector connection error 2) Compressor error 3) IPDU P.C. board error

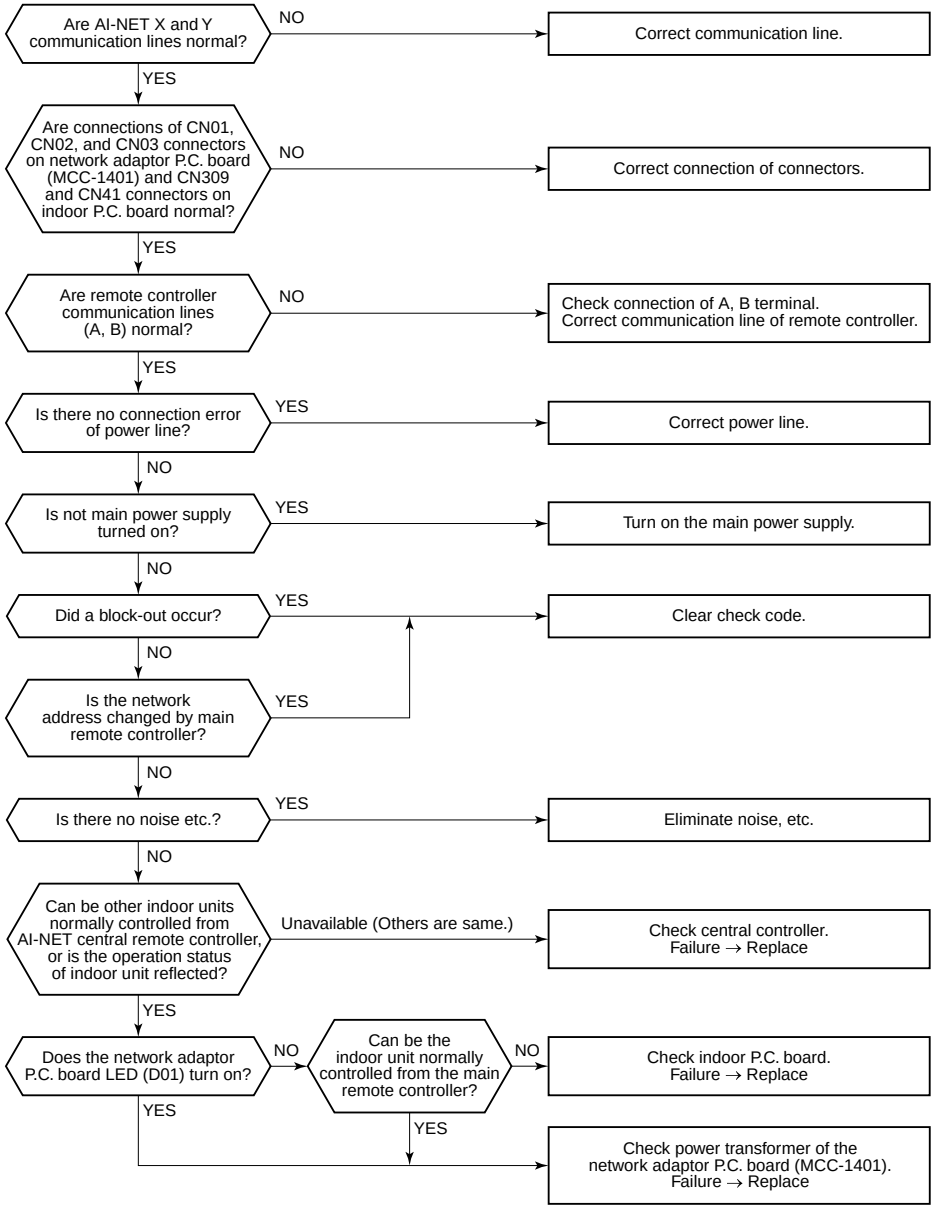
Sub-code: 01: Compressor 1 side 02: Compressor 2 side



Check code name	Check code name	Cause of operation
[P31] / [47] (d07 / AI-NET)	**Other indoor error (Group follower unit error)**	Other indoor unit in the group is abnormal.

When the header unit of the group detected [E03, L03, L07, L08 error], the follower unit of the group displays [P31] error and stops. There are no check code display and alarm record of the main remote controller.

Check code name	Check code name	Cause of operation
[–] / [97] (d07 / AI-NET)	**AI-NET communication line error**	AI-NET communication line error

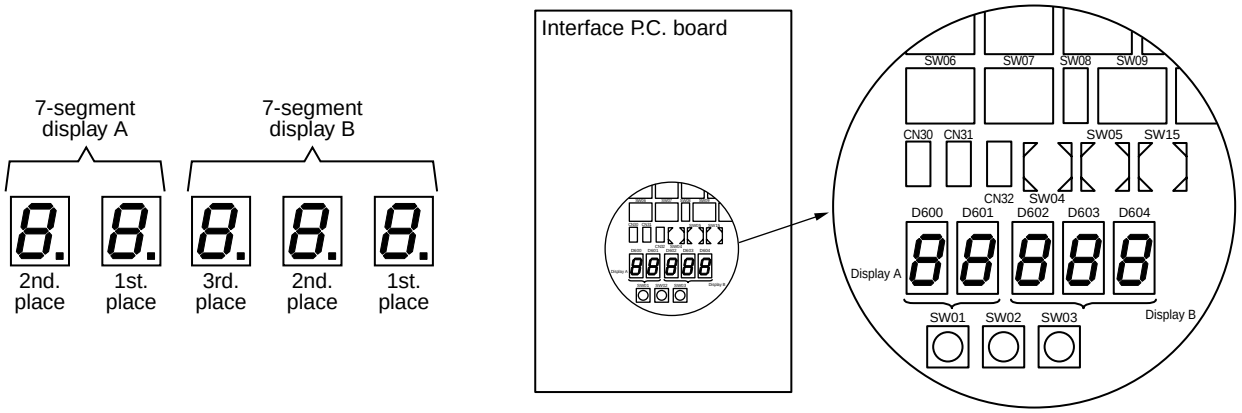

Are AI-NET X and Y communication lines normal?
NO
Correct communication line.
YES
Are connections of CN01, CN02, and CN03 connectors on network adaptor P.C. board (MCC-1401) and CN309 and CN41 connectors on indoor P.C. board normal?
NO
Correct connection of connectors.
YES
Are remote controller communication lines (A, B) normal?
NO
Check connection of A, B terminal.
Correct communication line of remote controller.
YES
Is there no connection error of power line?
YES
Correct power line.
NO
Is not main power supply turned on?
YES
Turn on the main power supply.
NO
Did a block-out occur?
YES
Clear check code.
NO
Is the network address changed by main remote controller?
YES
NO
Is there no noise etc.?
YES
Eliminate noise, etc.
NO
Can be other indoor units normally controlled from AI-NET central remote controller, or is the operation status of indoor unit reflected?
Unavailable (Others are same.)
Check central controller.
Failure → Replace
YES
Does the network adaptor P.C. board LED (D01) turn on?
NO
Can be the indoor unit normally controlled from the main remote controller?
NO
Check indoor P.C. board.
Failure → Replace
YES
YES
Check power transformer of the network adaptor P.C. board (MCC-1401).
Failure → Replace

8-6. 7-Segment Display Function

■ 7-segment display on the outdoor unit (Interface P.C. board)

On the interface control P.C. board, 7-segment LED to check the operating status is provided on the control P.C. board.

The displayed contents are changed by combining the setup numbers of the rotary switches (SW01, SW02, and SW03) on P.C. board.



◆ Check procedure in case of stop with trouble

When the system stopped due to a trouble of the outdoor unit, execute a check in the following procedure.

1. Open the panel of the outdoor unit, and then check the 7-segment display.
   The check code is displayed at the right side of 7-segment display B.
   [U1] [○○○] ([○○○]: Check code)
   ＊ Switch setup when confirming the check code: SW01 [1], SW02 [1], SW03 [1]
   However the check code [○○○] is displayed for 3 seconds and the sub-code [○○○] for 1 second are alternately displayed if an sub-code is provided.
2. Confirm the check code, and then conduct the check operation based on the procedure of each check code diagnosis.
3. [U1] [E28] on 7-segment display means a trouble on the follower unit.
   Push the push-switch SW04 on the header unit for several seconds. (2 seconds or more)
   As only the fan of the outdoor unit with a trouble drives, open the panel of the corresponding unit, and then confirm the check code displayed with 7-segment.
4. Perform the check operation based on the procedure of each check code diagnosis.

How to read the check monitor

<7-segment display>

1. Data display of system information (Displayed on the header outdoor unit only)

SW01	SW02	SW03	Display contents				
1	1	3	Refrigerant name	Displays refrigerant name.		A	B
				Model with refrigerant R410A		r4	10A
				Model with refrigerant R407C		r4	07C
	2		System capacity	A	[5] to [48] : 5 to 48HP		
				B	[HP]		
	3		No. of outdoor units	A	[1] to [4] : 1 to 4 units		
				B	[P]		
	4		No. of connected indoor units/ No. of units with cooling thermo ON	A	[0] to [48] : 0 to 48 units (No. of connected units)		
				B	[C0] to [C48] : 0 to 48 units (No. of units with cooling thermo ON)		
	5		No. of connected indoor units/ No. of units with heating thermo ON	A	[0] to [48] : 0 to 48 units (No. of connected units)		
				B	[H0] to [H48] : 0 to 48 units (No. of units with heating thermo ON)		
	6		Compressor command correction amount	A	Data is displayed with hexadecimal notation		
				B			
	7		Release control	A	Normal time : [r], During release control: [r1]		
				B	—		
	8		Oil-equalization control	A	Normal time : [oiL-0]		
				B	During oil equation : [oiL-1]		
	9		Oil-equalization request	A	Displays with segment LED lighting pattern		
				B	Display A Display B A F G B E C D Dp U2 U3 U4 F in the left figure goes on: Header requests oil equalization. C in the left figure goes on: Follower requests oil-equalization. (Outdoor unit number)		
	10		Refrigerant/oil recovery operation	A	During sending of cooling refrigerant oil recovery signal : [C1]. Normal time : [C]		
				B	During sending of heating refrigerant oil recovery signal : [H1]. Normal time : [H]		
	11		Automatic address	A	[Ad]		
				B	Automatic addressing : [FF], Normal time : [ ]		
	12		Demand operation	A	[dU]		
				B	Normal time : [ ]. In 50% to 90% : [50 to 90] When controlling by communication line input : [E50 to E90]		
	13		Optional control (P.C. board input)	Displays optioned control status		A	B
				Operation mode selection : In heating with priority (Normal)		h.∗	∗.∗.∗.
					Priority on cooling	c.∗	∗.∗.∗.
					Heating only	H.∗	∗.∗.∗.
					Cooling only	C.∗	∗.∗.∗.
					Priority on No. of operating indoor units	n.∗	∗.∗.∗.
					Priority on specific indoor unit	U.∗	∗.∗.∗.
				Batch start/stop : Normal		∗.⋯.	∗.∗.∗.
					Start input	∗.1.	∗.∗.∗.
					Stop input	∗.0.	∗.∗.∗.
				Night low-noise operation : Normal		∗.∗.	⋯.∗.∗.
					Operation input	∗.∗.	1.∗.∗.
				Snow fan operation : Normal		∗.∗.	∗.⋯.∗.
					Operation input	∗.∗.	∗.1.∗.
	14		Option control (BUS line input)	Same as above			
	15		Unused				
	16		—	A	—		
				B	—		

∗ mark: Indicates none on display

2. Data display of outdoor unit information (Displayed on each outdoor unit)

SW01	SW02	SW03	Display contents					
1	1	1	Error data	A	Displays outdoor unit number: [U1] to [U4]			
				B	Displays check code (Latest code only is displayed.) There is no check code: [– – –] There is sub-code: Check code [∗ ∗ ∗] for 3 seconds, sub-code [– ∗ ∗] for 1 second alternately			
			<SW04> push function : Fan of unit with error only drives. 7-segment A: [E1] <SW04 + SW05> push function : Fan of normal unit only drives. 7-segment A: [E0] <SW05> push function : Interruption of fan operation function					
	2		—	A	—			
				B	—			
	3		Operation mode	A	Stop: [ ] Normal cooling: [C], Normal heating: [H], Normal defrost: [J]			
				B	—			
	4		Outdoor unit HP	A	5HP: [5], 6HP: [6], 8HP: [8], 10HP: [10], 12HP: [12]			
				B	[HP]			
	5		Compressor operation command	A	No.1 compressor operation command is displayed. Data display with Hexadecimal notation: [00 to FF]			
				B	No.2 compressor operation command is displayed. Data display with Hexadecimal notation: [00 to FF]			
			<SW04> push function : Inverter frequency is exchanged to decimal notation. 7-segment display (A/B) : [∗ ∗] [∗ ∗ H] (Normal display by pushing <SW05>)					
	6		Outdoor fan step	A	[FP]			
				B	Step 0 to 31: [0 to 31]			
	7		Compressor backup	A	Displays No.1 compressor setup status Normal: [ ], Backup setup: [C1]			
				B	Displays No.2 compressor setup status Normal: [ ], Backup setup: [C2]			
	8		—	A	—			
				B	—			
	9		Control valve output data	Displays control output status of solenoid valve			A	B
				4-way valve: ON			H. 1	··· ··· ···
				4-way valve: OFF			H. 0	··· ··· ···
	10			SV2: ON / SV5: OFF			2. 1	··· 5. 0
				SV2: OFF / SV5: ON			2. 0	··· 5. 1
	11			SV3A: ON / SV3B: OFF / SV3C: OFF /SV3D: OFF			3. 1	0 0 0
				SV3A: OFF / SV3B: ON / SV3C: OFF /SV3D: OFF			3. 0	1 0 0
				SV3A: OFF / SV3B: OFF / SV3C: ON /SV3D: OFF			3. 0	0 1 0
				SV3A: OFF / SV3B: OFF / SV3C: OFF /SV3D: ON			3. 0	0 0 1
	12			SV41: ON / SV42: OFF			4. ···	1 0 ···
				SV41: OFF / SV42: ON			4. ···	0 1 ···
	13			—			··· ···	··· ··· ···
				—			··· ···	··· ··· ···
	14		PMV1 /PMV2 opening	Displays opening data (Decimal) (Total opening)			∗ ∗	∗ ∗. P
	15		—	—			··· ∗	∗ ∗. P
	16		Oil level judgment status	A	[oL] <SW05> push SW function: The following data is displayed for 2 seconds. * During oil shortage in compressor 1: [L ···], during oil shortage in compressor 2: [··· L]			
				B	Initial display: [··· ··· ···], Oil level judgment result: [A. #. ∗] Judgment result of compressor 1 in [#], compressor 2 in [∗] (0: Normal, 1, 2: Shortage) is displayed.			

3. Data display of outdoor cycle (Displayed on each outdoor unit)

SW01	SW02	SW03	Display contents					
1	1	2	Pd pressure data	Pd pressure (MPaG) is displayed with decimal data. (MPaG: Approx. 1/10 value of kg/cm^{2}G data)			A	B
							P d.	∗. ∗ ∗
	2		Ps pressure data	Ps pressure (MPaG) is displayed with decimal data.			P S.	∗. ∗ ∗
	3		PL pressure conversion data	Estimated pressure of liquid line (MPaG) is displayed with decimal data.			P L.	∗. ∗ ∗
	4		TD1 sensor data	Temperature sensor data (°C) is displayed with decimal notation. • Symbol display for 1 sec. and data display for 3 sec. are alternately displayed. • Data is displayed in [∗]. • Negative data is displayed as [– ∗ ∗ ∗ ∗].		Symbol	t d	1
						Data	∗	∗ ∗. ∗
	5		TD2 sensor data			Symbol	t d	2
						Data	∗	∗ ∗. ∗
	6		TS1 sensor data			Symbol	t S	1
						Data	∗	∗ ∗. ∗
	7		TS2 sensor data			Symbol	tS	2
						Data	∗	∗ ∗. ∗
	8		TE sensor data			Symbol	tE	—
						Data	—	—
	9		TL sensor data			Symbol	t L	
						Data	∗	∗ ∗. ∗
	10		TO sensor data			Symbol	t o	
						Data	∗	∗ ∗. ∗
	11		TK1 sensor data			Symbol	F 1	
						Data	∗	∗ ∗. ∗
	12		TK2 sensor data			Symbol	F 2	
						Data	∗	∗ ∗. ∗
	13		TK3 sensor data			Symbol	F 3	
						Data	∗	∗ ∗. ∗
	14		TK4 sensor data			Symbol	F 4	
						Data	∗	∗ ∗. ∗
	15		—	A	—			
				B	—			
	16		—	A	—			
				B				

4. Data display of indoor unit information (Displayed on the header unit only)

SW01	SW02	SW03	Display contents		
4	1 to 16	1 to 3	Receiving status of indoor BUS communication	B	Receiving time: [⋯ ⋯ 1], Not received: [⋯ ⋯ ⋯]
5			Indoor check code	B	No check code: [– – –]
6			Indoor capacity (HP) horse power	B	0. 2, 0. 5, 0. 8, ⋯ 1, 1. 2, 1. 7, ⋯ 2, 2. 5, ⋯ 3, 3. 2, ⋯ 4, ⋯ 5, ⋯ 6, ⋯ 8, 1 0, 1 6, 2 0
7			Indoor request command (S code)	B	Data is displayed with Hexadecimal notation [⋯ ⋯ 0 to ⋯ ⋯ F] : Heating
8			Indoor PMV opening data	B	Data is displayed with Hexadecimal notation
9			Indoor TA sensor data	B	Data is displayed with Hexadecimal notation
10			Indoor TF sensor data	B	Data is displayed with Hexadecimal notation
11			Indoor TCJ sensor data	B	Data is displayed with Hexadecimal notation
12			Indoor TC1 sensor data	B	Data is displayed with Hexadecimal notation
13			Indoor TC2 sensor data	B	Data is displayed with Hexadecimal notation

NOTE) Indoor address No. is chosen by changing SW02 and SW03.

SW03	SW02	Indoor address	7-segment display A
1	1 to 16	SW02 setup number	[01] to [16]
2	1 to 16	SW02 setup number + 16	[17] to [32]
3	1 to 16	SW02 setup number + 32	[33] to [48]

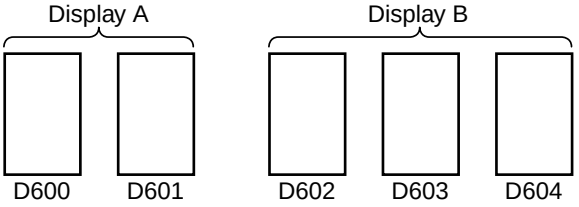
5. Outdoor EEPROM write-in error code display (Displayed on the header unit only)

∗ The latest error code written in EEPROM of each outdoor unit is displayed.
(It is used when confirming the error code after power supply has been reset.)

Set SW01 to 03 as shown in the following table, and the push SW04 for 5 seconds or more to display an error code.

W01	SW02	SW03	Display contents	7-segment display	
				A	B
1	1	16	The latest error code of the header unit 1 (U1)	E. r	1. – –
	2		The latest error code of the follower unit 1 (U2)	E. r	2. – –
	3		The latest error code of the follower unit 2 (U3)	E. r	3. – –

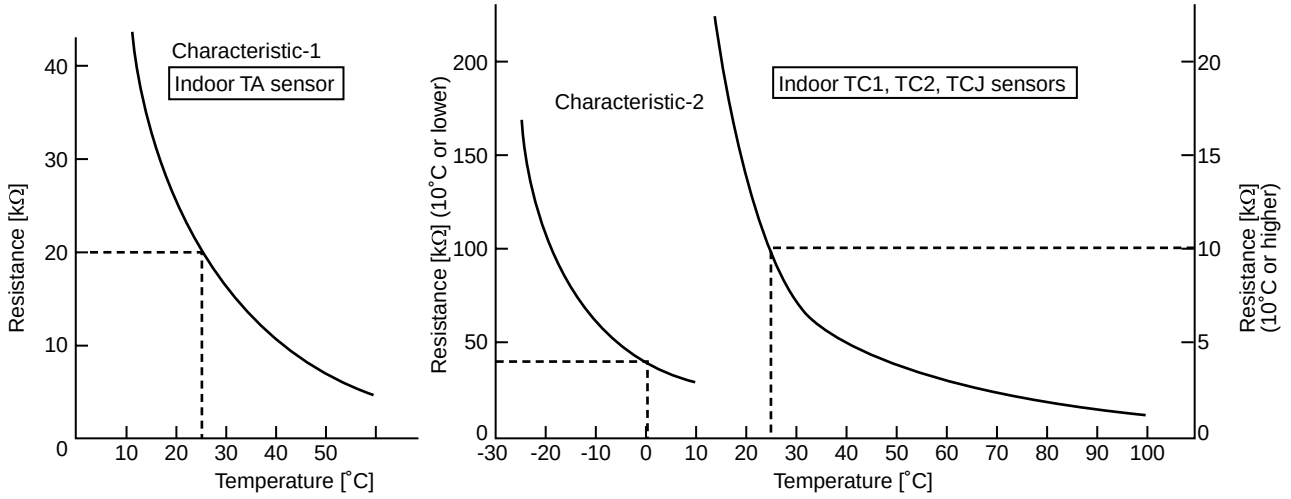
■ 7-segment display A, B



8-7. Sensor Characteristics

Indoor Unit

■ Temperature sensor characteristics

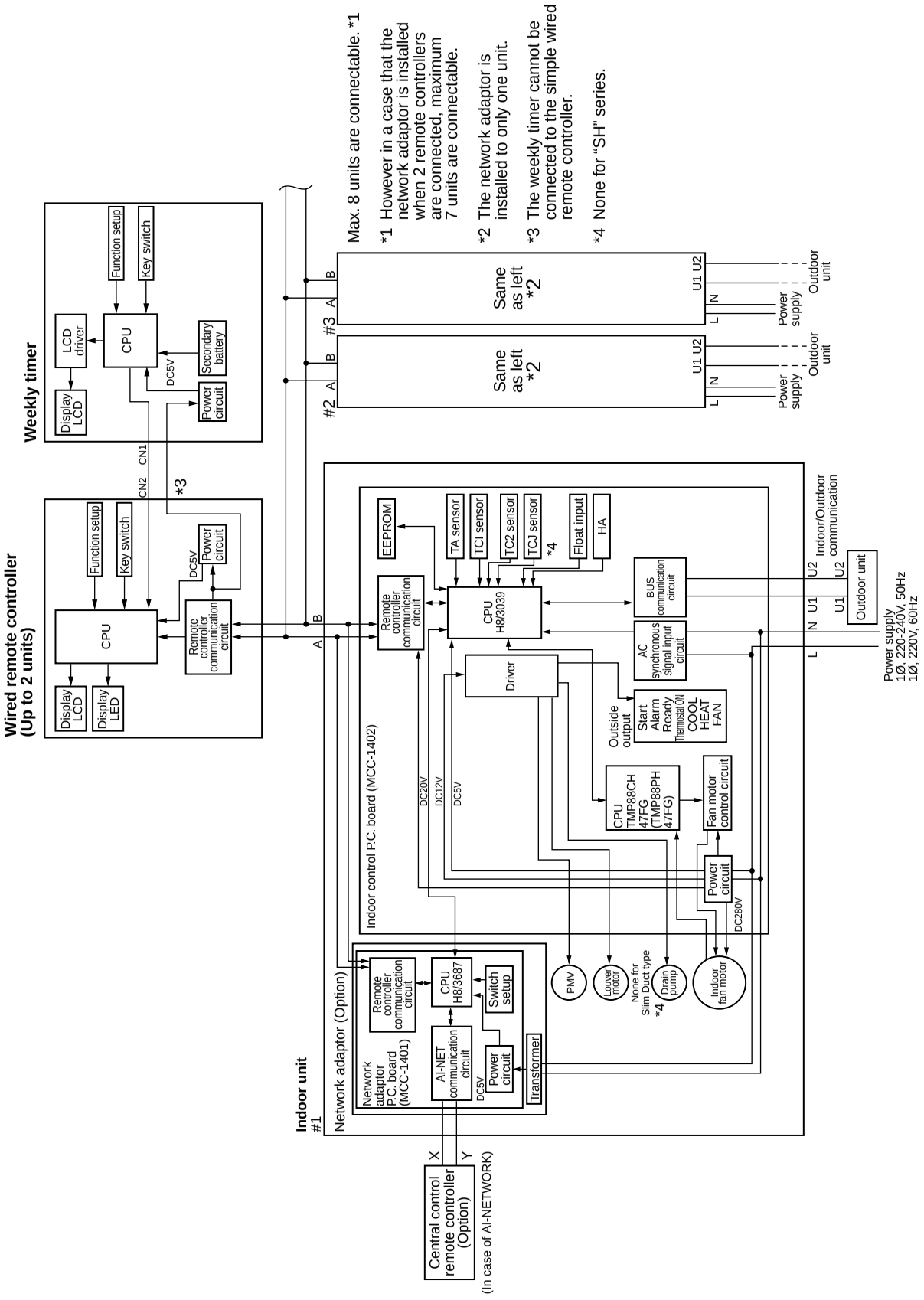


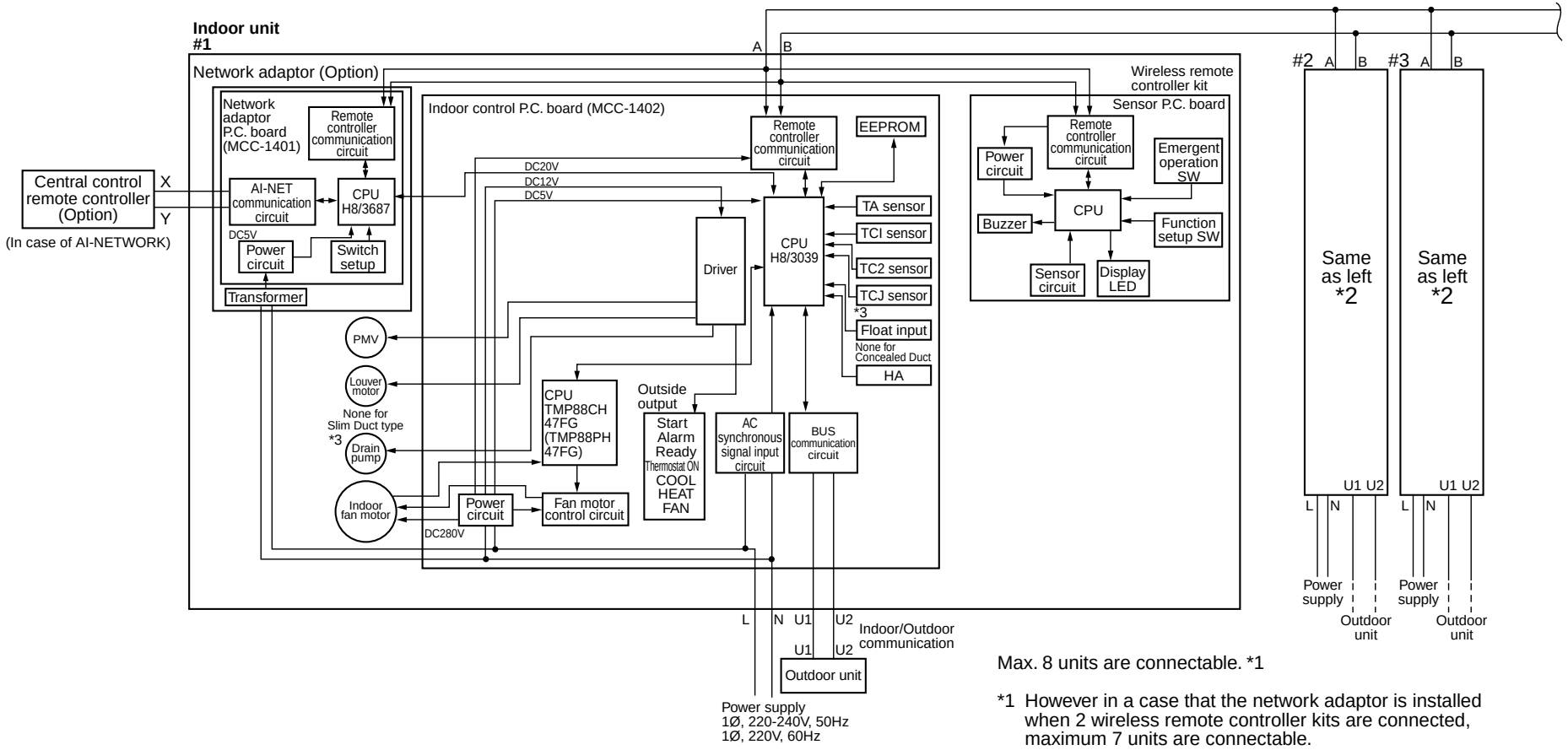
9. CONFIGURATION OF CONTROL CIRCUIT

9-1. Indoor Unit

9-1-1. Indoor Controller Block Diagram

1. Connection of wired remote controller


Max. 8 units are connectable. *1
*1 However in a case that the network adaptor is installed when 2 remote controllers are connected, maximum 7 units are connectable.
*2 The network adaptor is installed to only one unit.
*3 The weekly timer cannot be connected to the simple wired remote controller.
*4 None for "SH" series.
Weekly timer
Wired remote controller (Up to 2 units)
Same as left *2
Indoor control P.C. board (MCC-1402)
Network adaptor (Option)
Indoor unit #1
Outdoor unit
Power supply
Central control remote controller (Option)
(In case of AI-NETWORK)

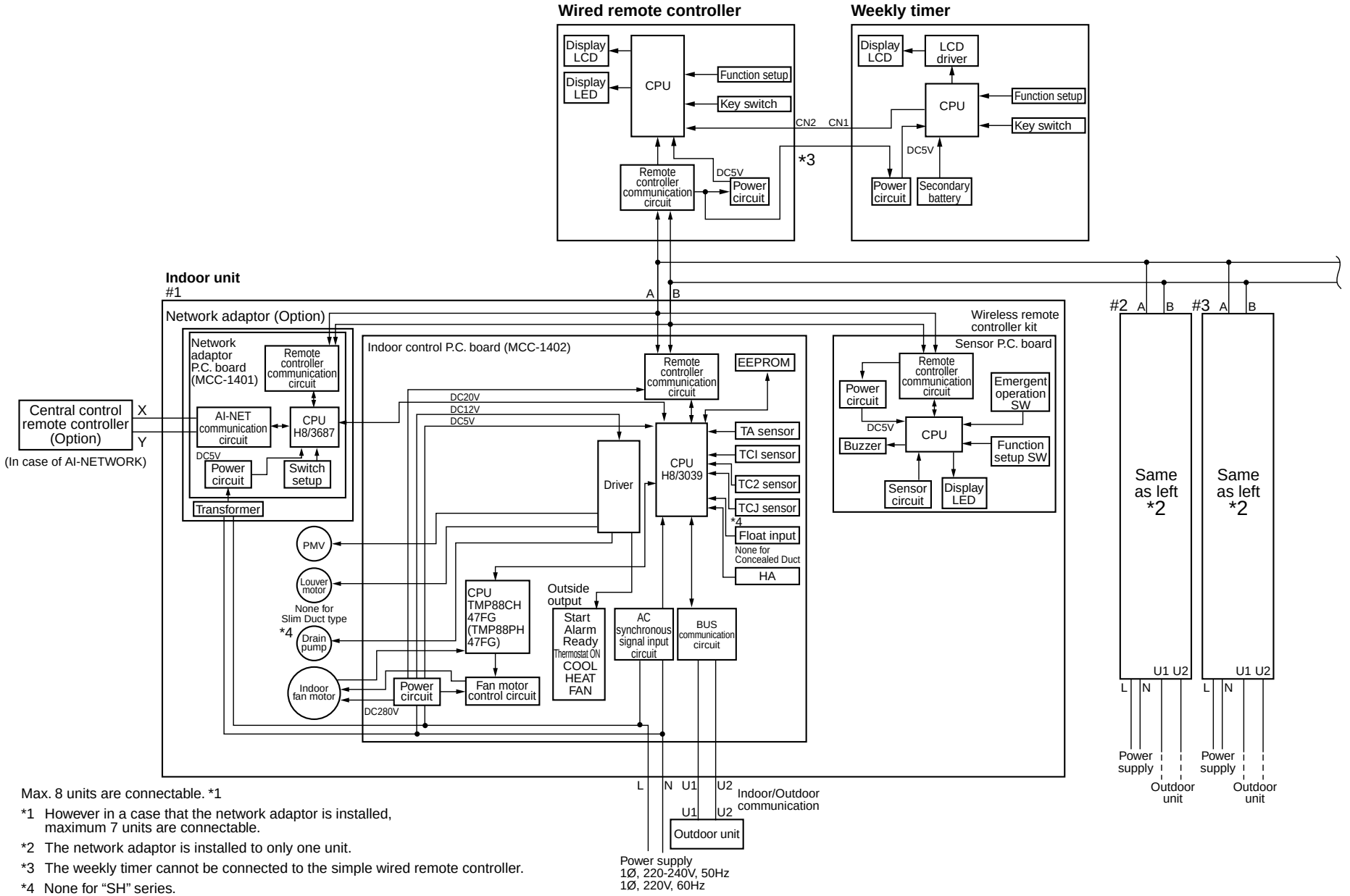


Max. 8 units are connectable. *1

*1 However in a case that the network adaptor is installed when 2 wireless remote controller kits are connected, maximum 7 units are connectable.

*2 The network adaptor is installed to only

*3 None for “SH” series.



Max. 8 units are connectable. *1

*1 However in a case that the network adaptor is installed, maximum 7 units are connectable.

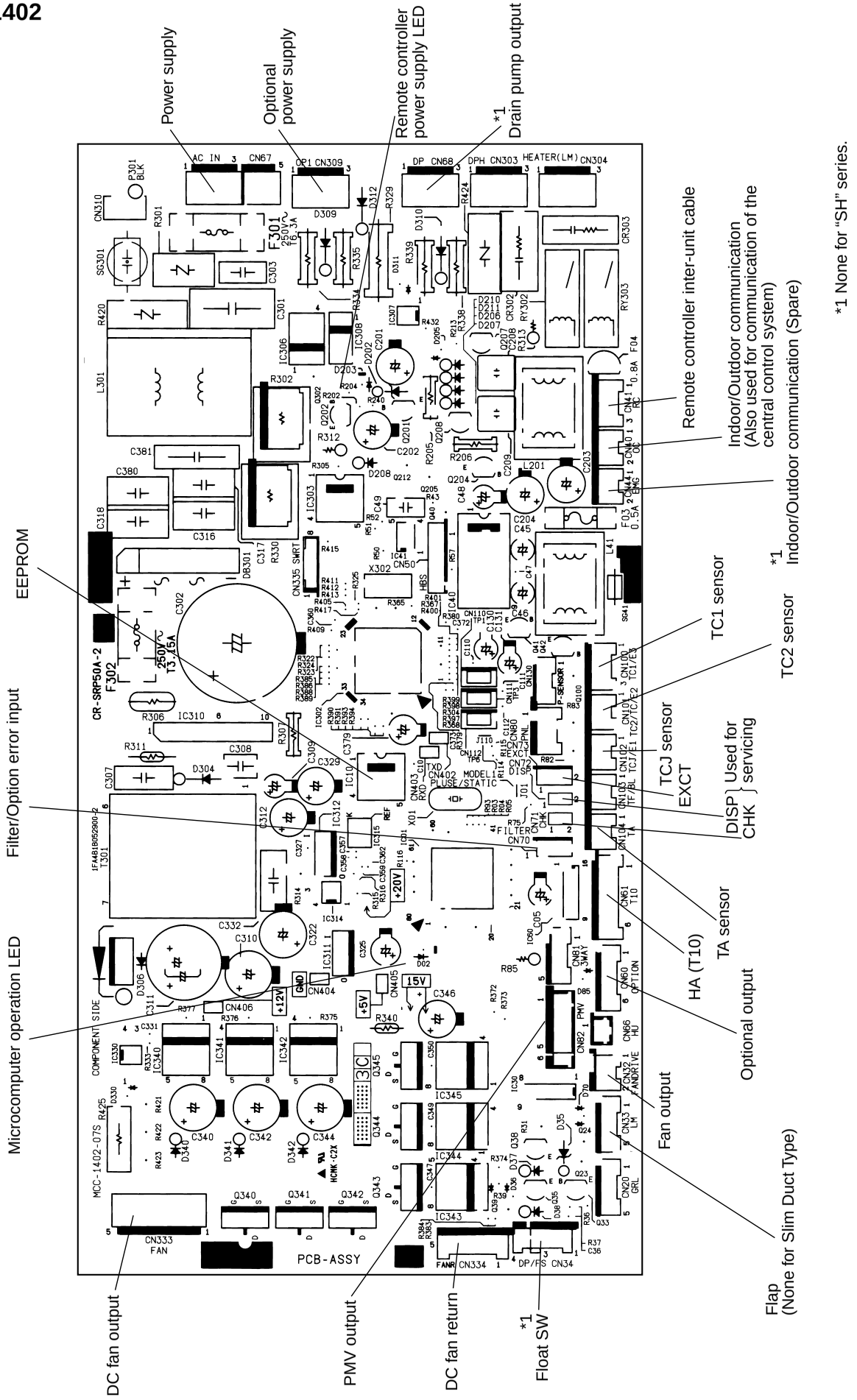
*2 The network adaptor is installed to only one unit.

*3 The weekly timer cannot be connected to the simple wired remote controller.

*4 None for “SH” series.

9-1-2. Indoor Print Circuit Board

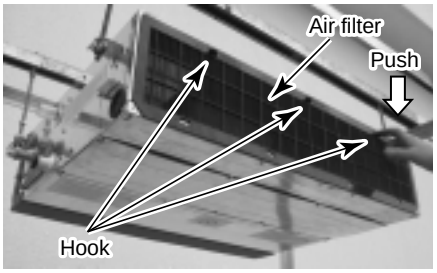
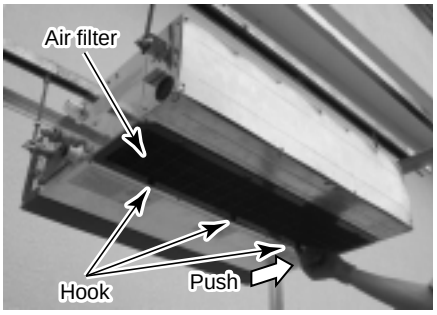
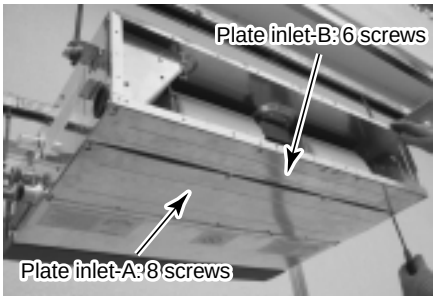
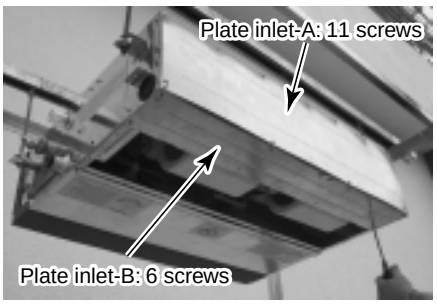
MCC-1402

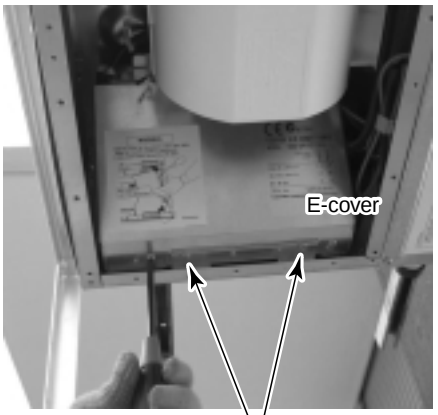
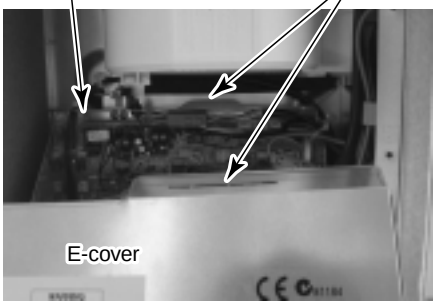
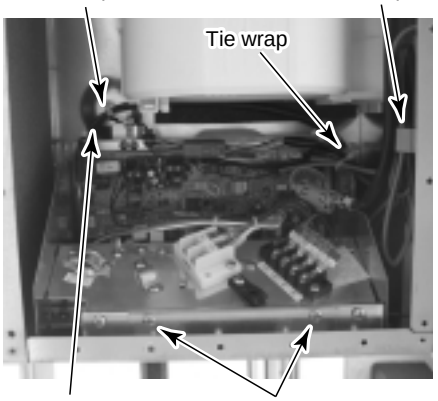


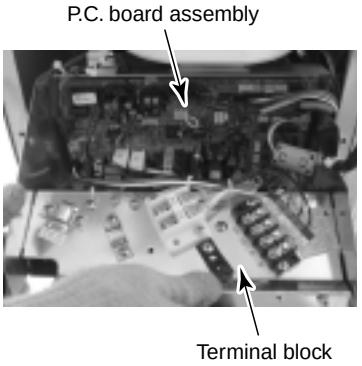
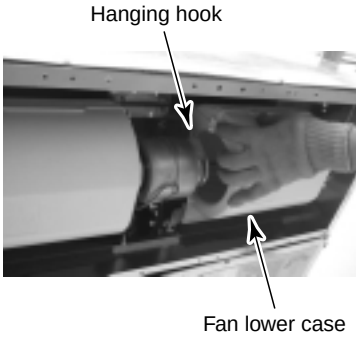
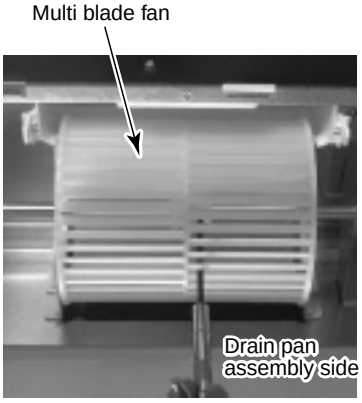
9-1-3. Optional Connector Specifications of Indoor P.C. Board

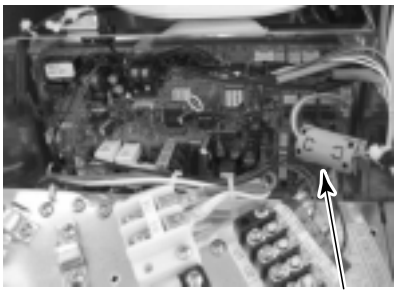
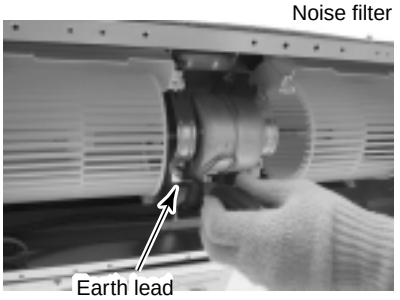
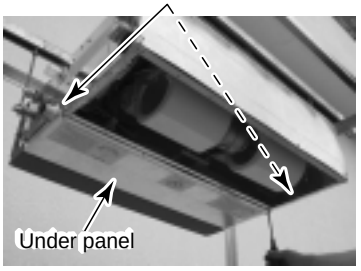
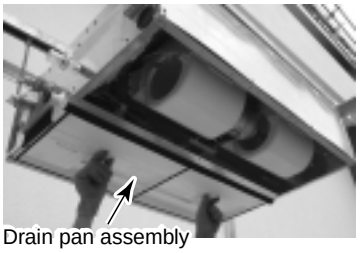
Function	Connector No.	Pin No.	Specifications	Remarks
Humidifier output	CN66	①	DC12V	In heating, thermo ON, Fan ON, Humidifier output ON * Humidifier provided, Drain pump ON is set up by CN70 short-circuit or from remote controller. (DN=40)
		②	Output	
Fan output	CN32	①	DC12V	Shipment setup: ON with indoor unit operation and OFF with stop are linked. * Single operation by FAN button on remote controller is set up from remote controller (DN=31)
		②	Output	
—	CN61	①	ON/OFF input	HA ON/OFF input (J01: YES/NO=Pulse (At shipment) / Static input select)
		②	0V (COM)	
		③	Main prohibition input	Operation stop of main remote controller is permitted / prohibited by input.
		④	Operation output	ON during operation (Answerback of HA)
		⑤	DC12V (COM)	
		⑥	Alarm output	ON during alarm output
Option output	CN60	①	DC12V (COM)	
		②	Defrost output	ON when outdoor unit is defrosted
		③	Thermo ON output	ON during Real thermostat ON (Compressor ON)
		④	COOL output	ON when operation mode is cooling system (COOL, DRY, Cool/Heat Auto cooling)
		⑤	HEAT output	ON when operation mode is heating system (HEAT, Cool/Heat Auto cooling)
		⑥	Fan output	ON when indoor fan is ON (During use of air cleaner/Interlock cabling)
Outside error input	CN80	①	DC12V (COM)	Generate check code “L30” (for 1 minute continuously) to stop forcedly the operation.
		②	DC12V (COM)	
		③	Outside error input	
—	CN20	—	—	—
—	CN70	—	—	—
CHK operation check	CN71	①	Check mode input	Used for indoor operation check. (Outdoor does not communicate with remote controller, and outputs specified operation such as indoor fan “H”, drain pump ON, etc.)
		②	0V	
DISP exhibition mode	CN72	①	Display mode input	Exhibition mode enables to communicate by indoor unit and remote controller only. (When power has been turned on.) Timer short (Usual)
		②	0V	
EXCT demand	CN73	①	Demand input	Indoor unit forced thermostat OFF operation
		②	0V	

10. DETACHMENTS

No.	Part name	Procedure	Remarks
		REQUIREMENT Be sure to put on gloves at working; otherwise an injury may be caused by parts, etc. • Before replacement of the parts, be sure to stop operation of the air conditioner and turn off switch of the breaker.	
①	Air Filter only for MMD-AP0071SPH to AP0181SPH MMD-0071SPH-K to AP0181SPH-K	**1. Detachment** 1) Push knobs (3 positions) of the air filter hooks toward the arrow direction to remove the air filter. **2. Attachment** 1) Insert the air filter surely into the hooking grooves (4 positions) at the opposite side of the hooks, and then fix it to the original position. **NOTE)** In case of sucking system from bottom side, installation direction is determined. Install the air filter so that hooks are aligned at discharge side.	**[In case of sucking system from rear side]**  **[In case of sucking system from bottom side]** 
②	Plate inlet-A Plate inlet-B	**1. Detachment** 1) Take off fixing screws while holding the plate inlet-A with hands to remove it. (Sucking system from rear side: Ø4 × 10, 8 pcs) (Sucking system from bottom side: Ø4 × 10, 11 pcs) 2) Take off fixing screws while holding the plate inlet-B with hands to remove it. (Ø4 × 10, 6 pcs) **NOTE)** Be careful that sheeting metal does not fall when removing the plate inlet. **2. Attachment** 1) Using the screws taken off in procedure **1.** 2) of ②, attach the plate inlets in order of B → A while holding them not to fall down.	**[In case of sucking system from rear side]**  **[In case of sucking system from bottom side]** 

No.	Part name	Procedure	Remarks
③	E-cover	**1. Detachment** 1) Perform work **1.** of ②. 2) Take off screws fixing E-cover, and then remove hooks of the hooking part by lifting up. (Ø4 × 10, 2 pcs) **2. Attachment** 1) Hang on E-cover to hooks of the hooking part so that it does not fall down. **NOTE)** Be sure not to catch TA sensor in the E-cover; otherwise the equipment cannot operate correctly. 2) Using the screws taken off in procedure **1.** 2) of ③, attach E-cover while holding it with hands without clearance. **NOTE)** If there is clearance, dust may enter in the electric parts box.	 2 screws TA sensor Hooking part 
④	E-box	**1. Detachment** 1) Perform works **1.** of ② and **1.** of ③. 2) Remove clamps and tie wrap at upper part of the photo. (Drain pump incorporated model: 3 positions) (Natural drain model: 2 positions) 3) Take off screws fixing E-box. (Ø4 × 10, 2 pcs) E-box does not fall down under condition that screws are taken off. 4) Remove the E-box over sheeting metal which was fixed with screws. **2. Attachment** 1) Insert hooks of E-box into the hooking part of the main body. 2) Store E-box as before, and then attach it by using screws taken off in procedure **1.** 3) of ④. **NOTE)** Be sure to fix surely as before the lead wires of which clamps and tie wrap were taken off. **NOTE)** Check that lead wires of the drain pump do not reach the fan so that they are not caught in the fan, and then fix them. (In case of drain pump incorporated model)	Clamp Clamp  Drain pump 2 screws Lead wire: For only drain pump incorporated model

No.	Part name	Procedure	Remarks
⑤	P.C. board assembly	**1. Detachment** 1) Perform works **1.** of ②, **1.** of ③, and **1.** of ④. 2) Disconnect connectors which are connected from P.C. board assembly to other parts. **NOTE)** Unlock the lock of the housing to disconnect the connectors. CN40 : Indoor/Outdoor communication (3P: Blue) Communication terminal block: 2P CN41 : Remote controller terminal (3P: Blue) Remote controller terminal block: 2P CN67 : Power supply terminal (3P: Black) CN100 : TC1 sensor (3P: Brown) CN101 : TC2 sensor (2P: Black) CN102 : TCJ sensor (2P: Red) CN333 : Fan motor power supply (5P: White) CN334 : Detection of fan motor position (5P: White) Relay connector (CN82): PMV lead (6P: Blue) **(In case of drain pump incorporated model)** CN34 : Float SW (3P: Red) CN68 : Drain pump lead (3P: Blue) 3) Unlock the lock of the card edge spacer, and then remove P.C. board assembly. **2. Attachment** 1) Attach P.C. board assembly to the card edge spacer. 2) Using wires connect connectors as before, which were disconnected in procedure **1.** 2) of ⑤. **NOTE)** Check there is no missing or poor contact of the connectors.	
⑥	Multi blade fan case, fan lower case, fan upper case	**1. Detachment** 1) Perform work **1.** of ②. 2) Take off hanging hooks at both sides of the lower fan case to remove fan lower case. 3) Remove the upper fan case while taking off hooks of fan upper case which are hooked to the partition board. 4) Loosen hexagonal hole screw of the multi blade fan to remove multi blade fan from the shaft. If necessary, remove multi blade fan and then remove fan upper case. **2. Attachment** 1) Determine the position so that multi blade fan positions at the center of the fan upper case, and then fix it with hexagonal hole screw. **NOTE)** Arrange the multi blade fan so that screws position at the right side against the drain pan assembly. **NOTE)** Fix multi blade fan with torque wrench 4.9 N•m or more. 2) Hook the lower fan case as before and attach it with hooks. **NOTE)** Finally check whether the multi blade fan turns surely and smoothly or not.	  Arrange the multi blade fan so that screws position at the right side against the drain pan assembly.

No.	Part name	Procedure	Remarks
⑦	Fan motor	**1. Detachment** 1) Perform works **1.** of ②, **1.** of ③, **1.** of ⑥. 2) Remove lead wires which are connected to the following connectors of P.C. board assembly. **NOTE)** Unlock locks of the housing, and then remove the connectors. CN333: Fan motor power supply (5P: White) CN334: Detection of fan motor (5P: White) Remove tie wrap which fixes lead wires. 3) Remove the noise filter from lead wire to detect fan motor position. 4) Take off screws of fan motor fixing bracket. Earth wires of the motor are tightened together. (Ø5 × 10, 2 pcs) Remove tie wrap which fixes the lead wires. 5) Remove fixing bracket of the fan motor by holding it with hands so that the fan motor does not fall down. **2. Attachment** 1) Mount the fan motor as before in order, Fan motor → Fixing bracket of fan motor → Noise filter → Lead wire process → E-cover. **NOTE)** Check there is no missing or poor contact of the connectors. Check also that the multi blade fan turns surely and smoothly, and check together-tightening of motor earth.	 Noise filter  Earth lead
⑧	Under panel Drain pan assembly	**1. Detachment** 1) Take off the drain cap and drain the drain water accumulated in the drain pan assembly. In case of natural drain model, drain the drain water by taking off hose band and drain hose. **NOTE)** When taking off drain cap and drain hose, be sure receive drain water in a bucket, etc. 2) Take off screws fixing the under panel while holding it to remove. (Ø4 × 10, 8 pcs) **NOTE)** Be careful that sheeting metal does not fall when removing the under panel. 3) Pull out the drain pan assy. by holding handle at lower part. **NOTE)** When pulling out the drain pan assy., never pull out the drain socket by drawing it with hands. If doing so, water leak may be caused. 4) Pull out it to some extent, lay hand on the bump at suction side, and then remove the drain pan assembly. **2. Attachment** 1) Hook and attach the drain pan assy. to the flange at discharge side, and then push in. 2) Using screws taken off in procedure **1.** 2) of ⑧, attach under panel by holding with hands. 3) Attach drain cap, hose band, and drain hose as before, which were taken off in procedure **1.** 1) of ⑧. **NOTE)** Finally, be sure to check there is no water leakage from each attached part.	Drain cap or drain hose  Under panel  Drain pan assembly NO GOOD Never hold and pull the drain socket.

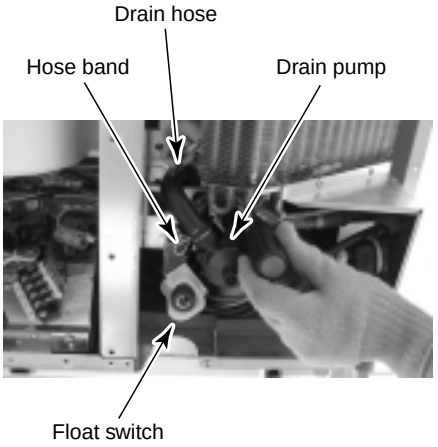
<table>
<tr><th>No.</th><th>Part name</th><th>Procedure</th><th>Remarks</th></tr>
<tr><td>⑨</td><td>Drain pump, Float switch, Drain hose
Only for
MMD-AP0071SPH to AP0181SPH
MMD-0071SPH-C to AP0181SPH-C
MMD-0071SPH-K to AP0181SPH-K</td><td>
1. Detachment
1) Perform works in procedures 1. of ②, 1. of ③, 1. of ⑧.
2) Disconnect lead wires which are connected to the following connectors of P.C. board assembly.

NOTE) Unlock locks of the housing to remove the connectors.

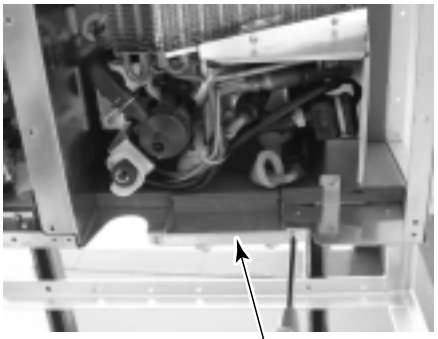
CN34: float SW (3P: Red)
CN68: Drain pump lead (3P: Blue)
3) Loosen hose band, remove cap of the drain hose, and take off screws while holding the sheeting metal on which float switch and drain pump are put on. Remove them with care that pipes are not damaged. (Ø4× 10, 2 pcs)

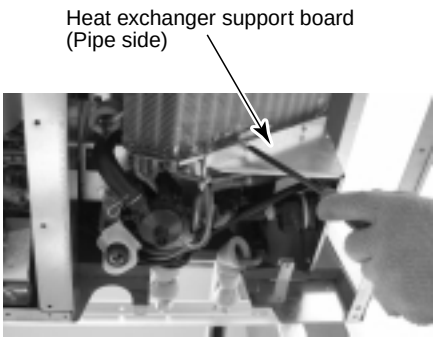
NOTE) If the pipes are damaged, refrigerant leak may be caused.
Take out them with great care.

2. Attachment
1) Attach ASSY sheeting metal which was removed in procedure 1. 3) of ⑨ with care that pipes are not damaged, and then fix it with screws.
2) Insert the drain hose into the inlet of drain pump, and then fix it with hose band. Arrange handle of the hose band at contrary side of heat exchanger side and at direction remote from drain pan assembly.
3) Carry out wiring as before, and then perform work of procedure 2. of ⑧.

NOTE) Finally check whether they correctly operate or not.
</td><td>


</td></tr>
<tr><td>⑩</td><td>Evaporator assembly</td><td>
1. Detachment
1) Recover refrigerant, and then remove refrigerant pipes at indoor unit side.
2) Perform works of procedures 1. of ②, 1. of ③, 1. of ⑧. Remove sensors.
3) Take off screws of the pipe holder, and remove the pipe holder. (Ø4 × 10, 2 pcs)
4) Take off screws of the heat exchanger support board (Pipe side), and remove the heat exchanger support board (Pipe side). (Ø4 × 10, 4 pcs)
5) Take off screws of the heat exchanger support board (Opposite side) which fixes terminal block of the evaporator assembly. (Ø4 × 10, 2 pcs)
6) Remove the evaporator assembly.

2. Attachment
1) Fasten the parts as before in order, Evaporator assembly → Pipe holder → Set sensors → Drain pan assembly → Under panel.
2) Connect the refrigerant pipe as before, and then perform vacuuming.
</td><td>




</td></tr>
</table>

11. P.C. BOARD EXCHANGE PROCEDURES

11-1. Exchange of P.C. Board for Indoor Service

Part code	Model type	P.C. board model	Label display on P.C. board
431-6V-269	MMD-AP✻✻1SPH series MMU-AP✻✻1SH series	MCC-1402	03DD M03

Requirement at exchange of P.C. board assembly for indoor service

Before exchange, in the fixed memory (hereinafter EEPROM, IC10) installed on the indoor P.C. board, the type exclusive to the model and the capacity code are stored at shipment from the factory. The important setup data such as line/indoor/group address which are set up (Auto/Manual) or high ceiling exchange setup at installation time, respectively.

Proceed with exchange of P.C. board assembly for indoor service in the following procedure.

After exchange work, check again the setup for indoor unit No. or group header/follower units to confirm whether the setup contents are correct or not, and then check also the refrigerant circuit system by a test operation, etc.

<Exchange procedure>

Method 1

Before exchange, it is possible to turn on power of the indoor unit and read out the setup contents from the wired remote controller.

Readout of EEPROM data: **Procedure 1**

⇩

Exchange of P.C. board for service & power ON: **Procedure 2**

⇩

Writing-in of the readout EEPROM data: **Procedure 3**

⇩

Power supply reset (All the indoor units connected to the remote controller in case of group operation control)

Method 2

Before exchange, it is impossible to read out the setup contents due to EEPROM error.

Exchange of P.C. board for service & power ON: **Procedure 2**

⇩

Writing-in of the setup data such as the model name, capacity code, indoor unit address high ceiling setup, connection setup of option,
etc to EEPROM based upon customer's information: **Procedure 3**

⇩

Power supply reset (All the indoor units connected to the remote controller in case of group operation control)

Procedure 1 : Readout setup contents from EEPROM

(Contents of EEPROM with setup changed at local site include setup at shipment from the factory are read out.)

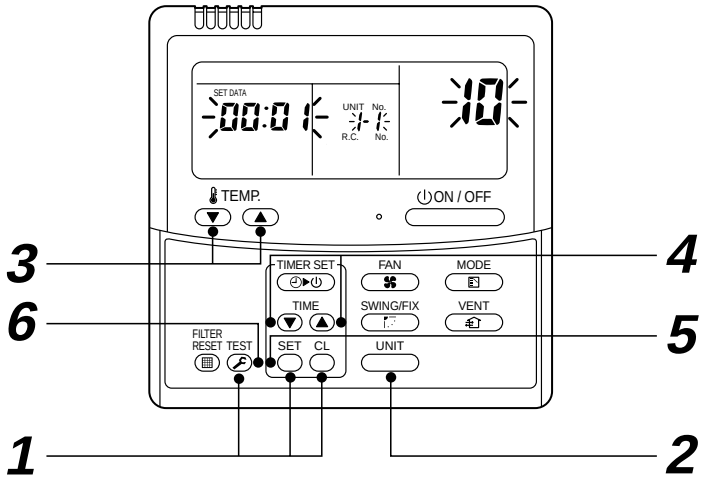
1. Push SET + CL + TEST buttons simultaneously for 4 seconds or more. ***1***
   * In a group operation control, the firstly displayed unit No. indicates the header indoor unit No.
     In this case, 10 is displayed in the item code (DN). The fan of the selected indoor unit operates, and also starts swinging in a model with flap.
2. Every pushing UNIT , the indoor unit Nos. in the group control are displayed successively. ***2***
   Specify the indoor unit No. to be exchanged.
   * The fan of the selected indoor unit operates, and also starts swinging in a model with flap.
3. Using temperature setup ▼ / ▲ buttons, the item code (DN) can be moved up/down one by one. ***3***
4. First change the item code (DN) from 10 → 01 . (Setup of filter sign lighting time)
   In this time, make a note of contents of the displayed setup data.
5. In the next time, change the item code (DN) using ▼ / ▲ buttons.
   Make a note of contents of the setup data as same as the above.
6. Then repeat item 5., and make a note of contents of the important setup data as indicated in the attached table (Example).
   * The item code (DN) is consisted with 01 to AA.
     DN No. may jump on the way.
7. When noting has finished, push TEST button to return to the normal stop status. ***6***
   (It requires approx. 1 minute to operate the remote controller.)

Item code necessary at minimum

DN	Contents
10	Type
11	Indoor unit capacity
12	Line address
13	Indoor address
14	Group address

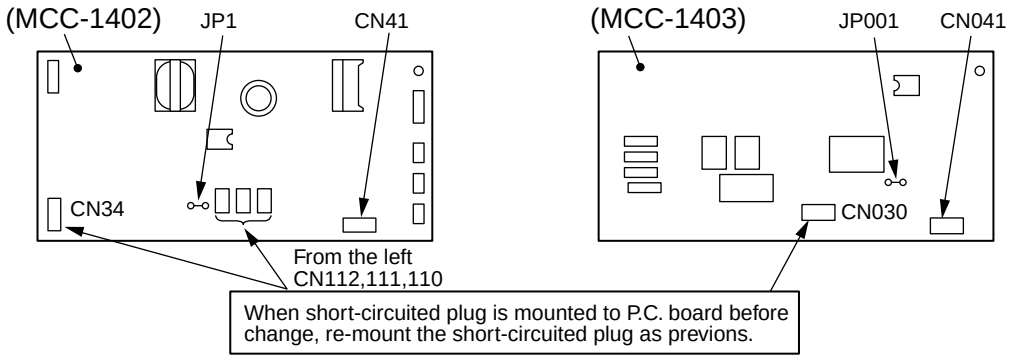
Type and capacity of the indoor unit are necessary to set up the revolution frequency of the fan.

<Remote controller operation diagram>



Procedure 2 : Exchange of P.C. board for service

1. Exchange P.C. board with a P.C. board for service.
   In this time, the jumper line (cut) setup or the (short-circuit) connecting connector setup on the previous P.C. board should be reflected on P.C. board for service. (See the blow figures.)



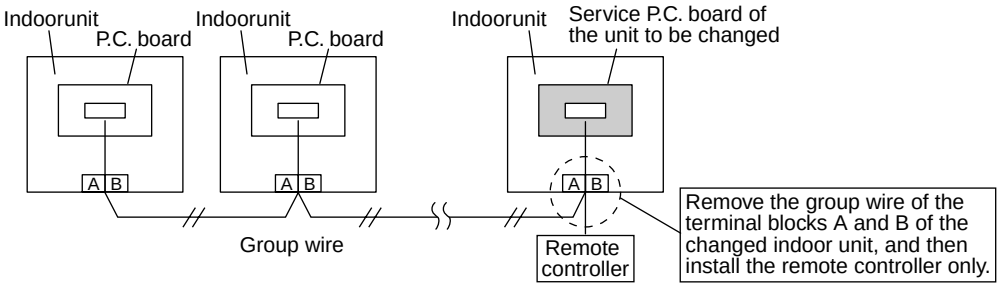
2. It is necessary to set Indoor unit to be exchanged : Remote controller = 1 : 1
   Based upon the system configuration, turn on power of the indoor unit with one of the following items.
   1) Single (Individual) operation
      Turn on power of the indoor units and proceed to **Procedure 3**.
   2) Group operation
      A) In case that power of the exchanged indoor unit only can be turned on
         Turn on power of the exchanged indoor unit only and proceed to **Procedure 3**.
      B) In case that power of the indoor units cannot be turned on individually (***Case 1***)
         a) Remove temporarily the group wire connected to the terminal blocks A and B of the exchanged indoor unit.
         b) After connecting the remote controller wire only to the removed terminal block, turn on power of the indoor units and proceed to **Procedure 3**.

      ∗ When the above methods cannot be used, follow to the two cases below.

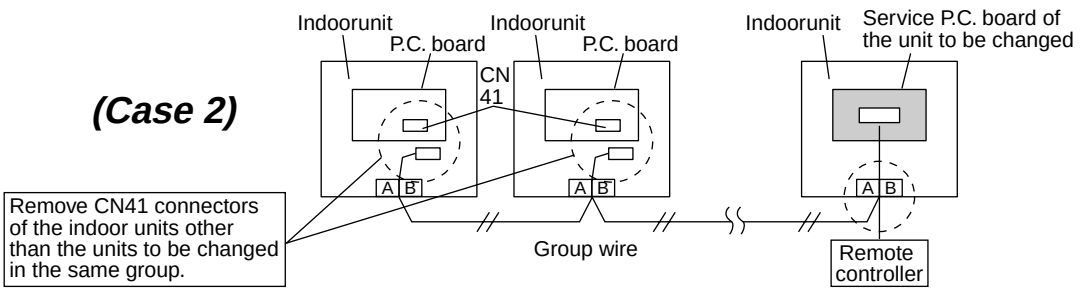
      C) In case that power of the indoor units cannot be turned on individually (***Case 2***)
         a) Remove all CN41 connectors of the indoor units in the same group except those of the exchanged indoor unit.
         b) Turn on power of the indoor units and proceed to **Procedure 3**.

      ∗ After **Procedure 3** operation has finished, be sure to return the temporarily removed group wire or CN41 connector to the original connection.

(Case 1)


Indoorunit
P.C. board
Indoorunit
P.C. board
Indoorunit
Service P.C. board of the unit to be changed
A B
A B
A B
Group wire
Remote controller
Remove the group wire of the terminal blocks A and B of the changed indoor unit, and then install the remote controller only.

(Case 2)



Procedure 3 : Writing-in of setup contents to EEPROM

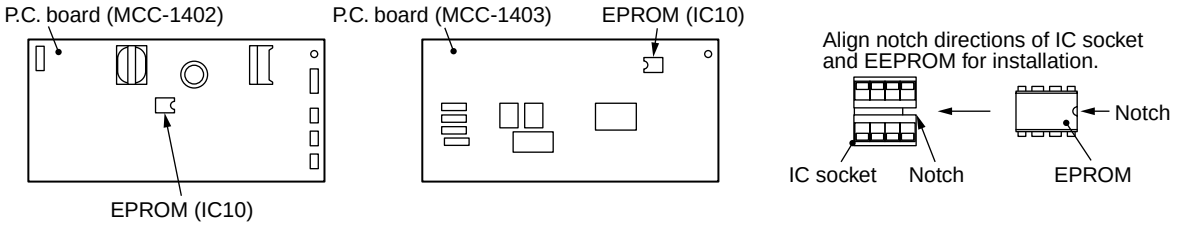
(The EEPROM contents which are installed on the service P.C. board have been set up at shipment from the factory.)

1. Push SET + CL + TEST buttons simultaneously for 4 seconds or more. **1**
   (ALL is displayed in the UNIT No box.)
   In this time, 10 is displayed in the item code (DN). The fan of the indoor unit operates, and also starts swinging in a model with flap.
2. Using temperature setup ▼ / ▲ buttons, the item code (DN) can be moved one step up 1 or down one by one. **3**
3. First set up the type and capacity code of the indoor unit.
   (The data at shipment from the factory is written in EEPROM by changing the type and capacity code.)
   1) Set 10 to the item code (DN). (As before)
   2) Using the timer time ▼ / ▲ buttons, set up the type. **4**
      (For example, 0001 indicates 4-way Air Discharge Cassette type.): Refer to the attached table.
   3) Push SET button. (OK if display goes on.) **5**
   4) Using temperature setup ▼ / ▲ buttons, set 11 to the item code (DN).
   5) Using the timer time ▼ / ▲ buttons, set up the capacity code.
      (For example, 0012 indicates 027 type.): Refer to the attached table.
   6) Push SET button. (OK if display goes on.)
   7) Push TEST button to return to the normal stop status.
4. In the next, the contents such as address setup, which were set up at the local site after installation are written in EEPROM. Execute again the operation in the above item 1.).
5. Using temperature setup ▼ / ▲ buttons, set 01 to the item code (DN).
   (Lighting time setup for filter sign)
6. Compare the contents of the setup data which is displayed in this time with contents noted in a memo in **Procedure 1** and customer's information.
   1) If data is incorrect, change it using the timer time ▼ / ▲ buttons so that it matches with contents noted in a memo, and then push SET button. (OK if display goes on.)
   2) Do nothing if data is same as those in the memo.
7. Using temperature setup ▼ / ▲ buttons, change the item code (DN).
   Check also the contents of the setup data and then change them it to those in the memo.
8. Then repeat operations in items 6. and 7.
9. After setup operation, push TEST button to return to the normal stop status. **6**
   In a group operation, turn off the power supply once, return the group wires between indoor units and CN41 connectors as before, and then turn on power of all the indoor units.
   (It requires approx. 1 minute to operate the remote controller.)
   * The item code (DN) is consisted with 01 to AA. DN No. may jump on the way.
     Even if pushing SET button after changing the data incorrectly, the data can be returned to one before change by pushing CL button before changing the item code (DN).

<EEPROM layout>

EEPROM (IC10) is attached to IC socket. To remove it, use a pair of tweezers, etc. To attach EEPROM, arrange the direction as shown in the following figures.

* In exchanging time, pay attention not to bend the lead wire of IC.



<Make a note of the setup contents. (Item code list (Example))>

DN	Item	Memo	Setup at shipment from factory
01	Filter sign lighting time		According to type
02	Dirty condition of filter		0000: Standard
03	Central control address		0099: Undefined
06	Heating inlet temp. shift		0002: +2°C (Floor standing: 0)
0d	Cooling Auto mode existence		0001: No auto mode cooling/heating (* Automatic selection by connected outdoor unit)
0F	Cooling only/Heat pump select		0000: Heat pump
10	Type		According to model type
11	Indoor unit capacity		According to capacity code
12	Line address		0099: Undefined
13	Indoor unit address		0099: Undefined
14	Group address		0099: Undefined
19	Louver type (Air direction adjustment)		According to type
1E	Temp. width between cooling and heating automatic selective control points		0003: 3 deg (Ts ± 1.5)
28	Automatic restart from power failure		0000: None
2A			
2E	HA terminal (T10) selection		0000: Normal
30			
31			
32	Sensor select		0000: Body sensor
40			
5d	High ceiling selection		0000: Standard
60	Timer setup (Wired remote controller)		0000: Possible

Type
Item code [10]

Setup data	Type	Model abb. name
0000	1-way Air Discharge Cassette	MMU-AP✻✻✻SH
0001✻	4-way Air Discharge Cassette	MMU-AP✻✻✻H
0002	2-way Air Discharge Cassette	MMU-AP✻✻✻WH
0003	1-way Air Discharge Cassette (Compact type)	MMU-AP✻✻✻YH
0004	Concealed Duct Standard	MMD-AP✻✻✻BH
0005	Slim Duct	MMD-AP✻✻✻SPH MMD-AP✻✻✻SH
0006	Concealed Duct High Static Pressure	MMD-AP✻✻✻H
0007	Under Ceiling	MMC-AP✻✻✻H
0008	High Wall	MMK-AP✻✻✻H
0009		
0010	Floor Standing Cabinet	MML-AP✻✻✻H
0011	Floor Standing Concealed	MML-AP✻✻✻BH
0012		
0013	Floor Standing (Below 6HP)	MMF-AP✻✻✻H

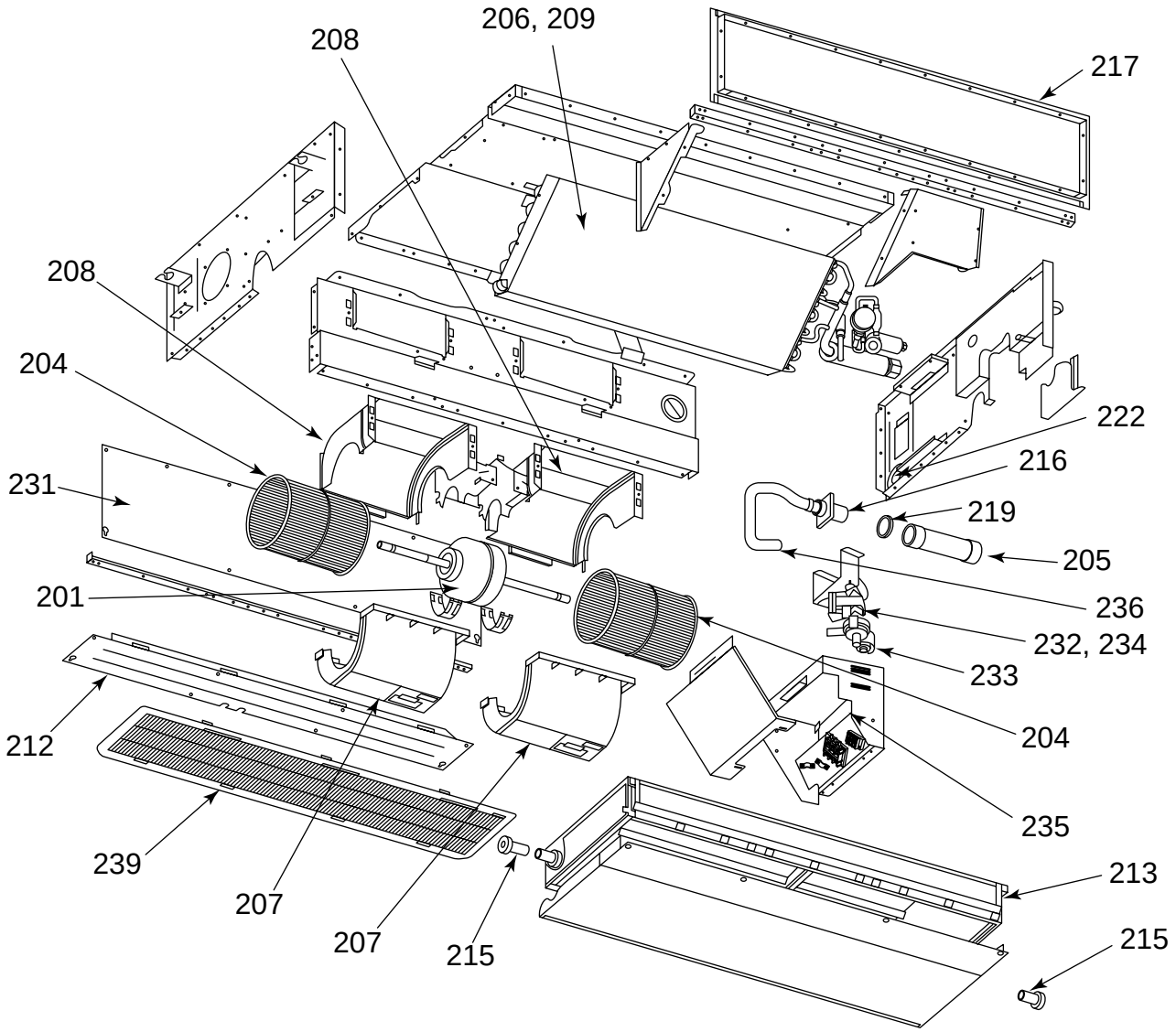
Indoor unit capacity
Item code [11]

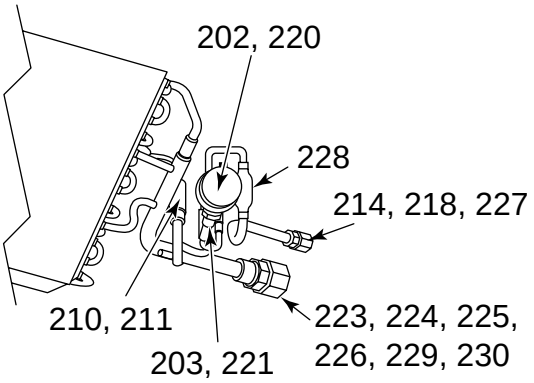
Setup data	Model	Setup data	Model
0000✻	Invalid	0016	—
0001	007 type	0017	048 type
0002	—	0018	056 type
0003	009 type	0019	—
0004	—	0020	—
0005	012 type	0021	072 type
0006	—	0022	—
0007	015 type	0023	096 type
0008	—	0024	—
0009	018 type	0025	—
0010	—	0026	—
0011	024 type	0027	—
0012	027 type	0028	—
0013	030 type	~	—
0014	—	0034	—
0015	036 type		

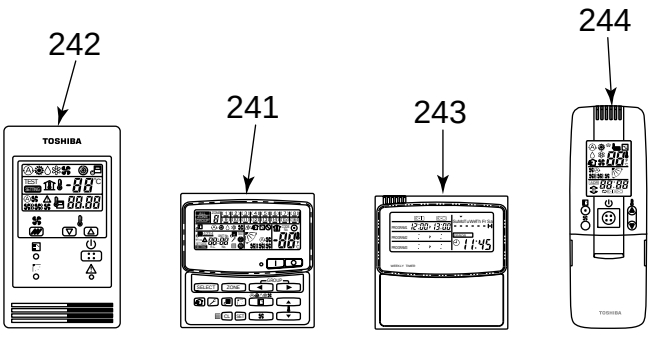
✻ The initial setup value of EEPROM installed on the service P.C. board

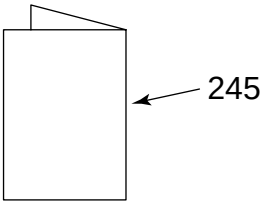
12. EXPLODED VIEWS AND PARTS LIST

MMD-AP0071SPH, AP0091SPH, AP0121SPH, AP0151SPH, AP0181SPH
MMD-AP0071SPH-K, AP0091SPH-K, AP0121SPH-K, AP0151SPH-K, AP0181SPH-K





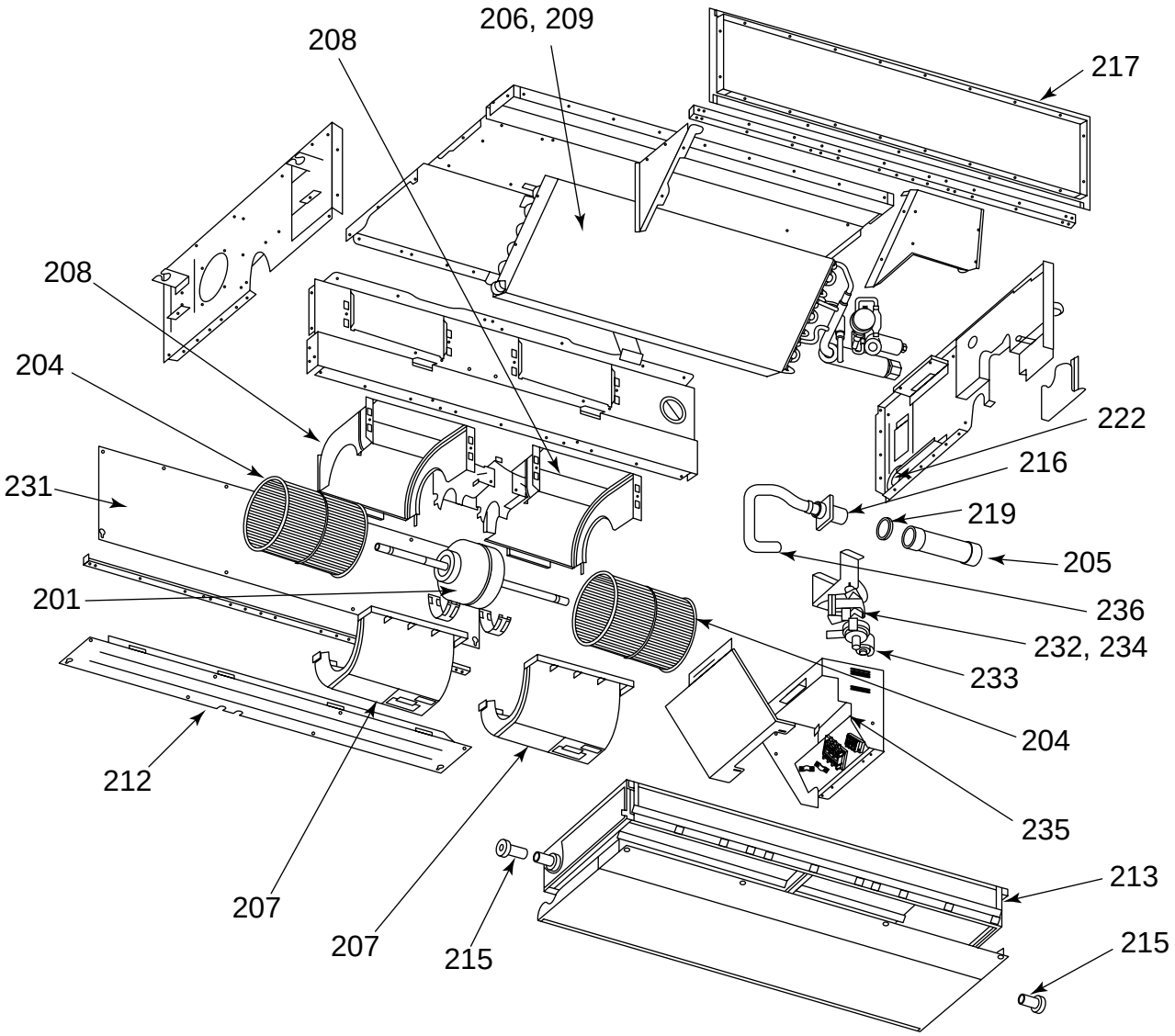


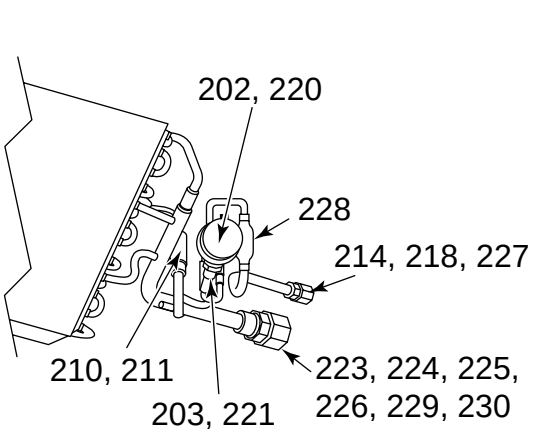


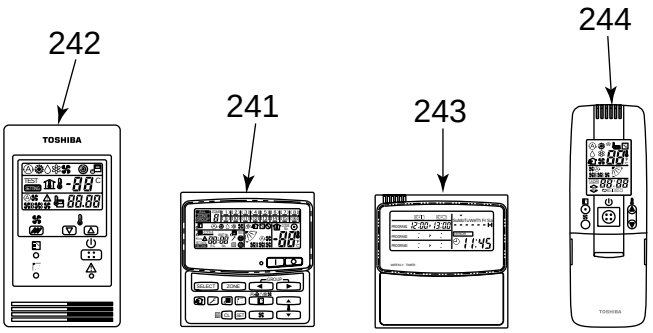
Location No.	Part	Description
201	43121715	Motor, Fan, SWF-280-60-1, 60W
202	43146555	Motor, P.M.V., EDM-MD12TF-3
203	43146677	Valve, P.M.V., EDM-B25YGTF-3 (0071SPH, 0091SPH, 0121SPH, 0071SPH-K, 0091SPH-K, 0121SPH-K)
204	43120222	Fan, Multi Blade, 140DIA, 180L
205	43170232	Hose, Drain, 25A
206	4314J239	Evaporator Ass'y (0151SPH, 0181SPH, 0151SPH-K, 0181SPH-K)
207	43122084	Case, Fan, Lower
208	43122085	Case, Fan, Upper
209	4314J261	Evaporator Ass'y, 460L (0071SPH, 0091SPH, 0121SPH, 0071SPH-K, 0091SPH-K, 0121SPH-K)
210	43146678	Distributor Ass'y (0071SPH, 0091SPH, 0121SPH, 0071SPH-K, 0091SPH-K, 0121SPH-K)
211	43146679	Distributor Ass'y (0151SPH, 0181SPH, 0151SPH-K, 0181SPH-K)
212	43100319	Plate, Inlet-B
213	43172183	Pan Ass'y, Drain, ABS + PS-F
214	43194051	Socket
215	43179129	Cap, Drain
216	43170240	Hose, Drain
217	43100321	Flange
218	43049697	Bonnet
219	43179133	Band, Hose
220	43149314	Sheet, P.M.V.
221	43146671	Valve, P.M.V., EDM-B40YGTF-30 (0151SPH, 0181SPH, 0151SPH-K, 0181SPH-K)

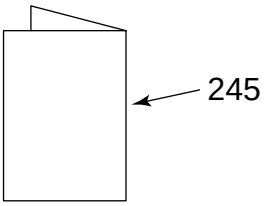
Location No.	Part	Description
222	43196109	Bushing
223	43194026	Socket (0071SPH, 0091SPH, 0121SPH, 0071SPH-K, 0091SPH-K, 0121SPH-K)
224	43194080	Socket, 1/2" (0151SPH, 0181SPH, 0151SPH-K, 0181SPH-K)
225	43194081	Nut, Flare, 1/2, IN (0151SPH, 0181SPH, 0151SPH-K, 0181SPH-K)
226	43047546	Nut, Flare, 3/8, IN (0071SPH, 0091SPH, 0121SPH, 0071SPH-K, 0091SPH-K, 0121SPH-K)
227	43047545	Nut, Flare, 1/4, IN
228	43147662	Strainer
229	43047609	Bonnet (0071SPH, 0091SPH, 0121SPH, 0071SPH-K, 0091SPH-K, 0121SPH-K)
230	43047303	Bonnet (0151SPH, 0181SPH, 0151SPH-K, 0181SPH-K)
231	43100320	Plate, Inlet-A
232	43121735	Pump, Drain, ADP-1409
233	43151287	Switch, Float, FS-0218-102
234	43179126	Rubber, Pump, Drain
235	43060029	Filter, Noise
236	43079249	Band, Hose
239	43180327	Air Filter
241	4316V194	Remote Controller, SX-A3JE
242	4316V195	Remote Controller, SX-A11JE
243	4316V196	Remote Controller, EX-W2JE
244	4316V197	Remote Controller, WH-H1JE
245	4311M422	Owner's Manual, MMY-MAP1201HT8

MMD-AP0071SPH-C, AP0091SPH-C, AP0121SPH-C, AP0151SPH-C, AP0181SPH-C





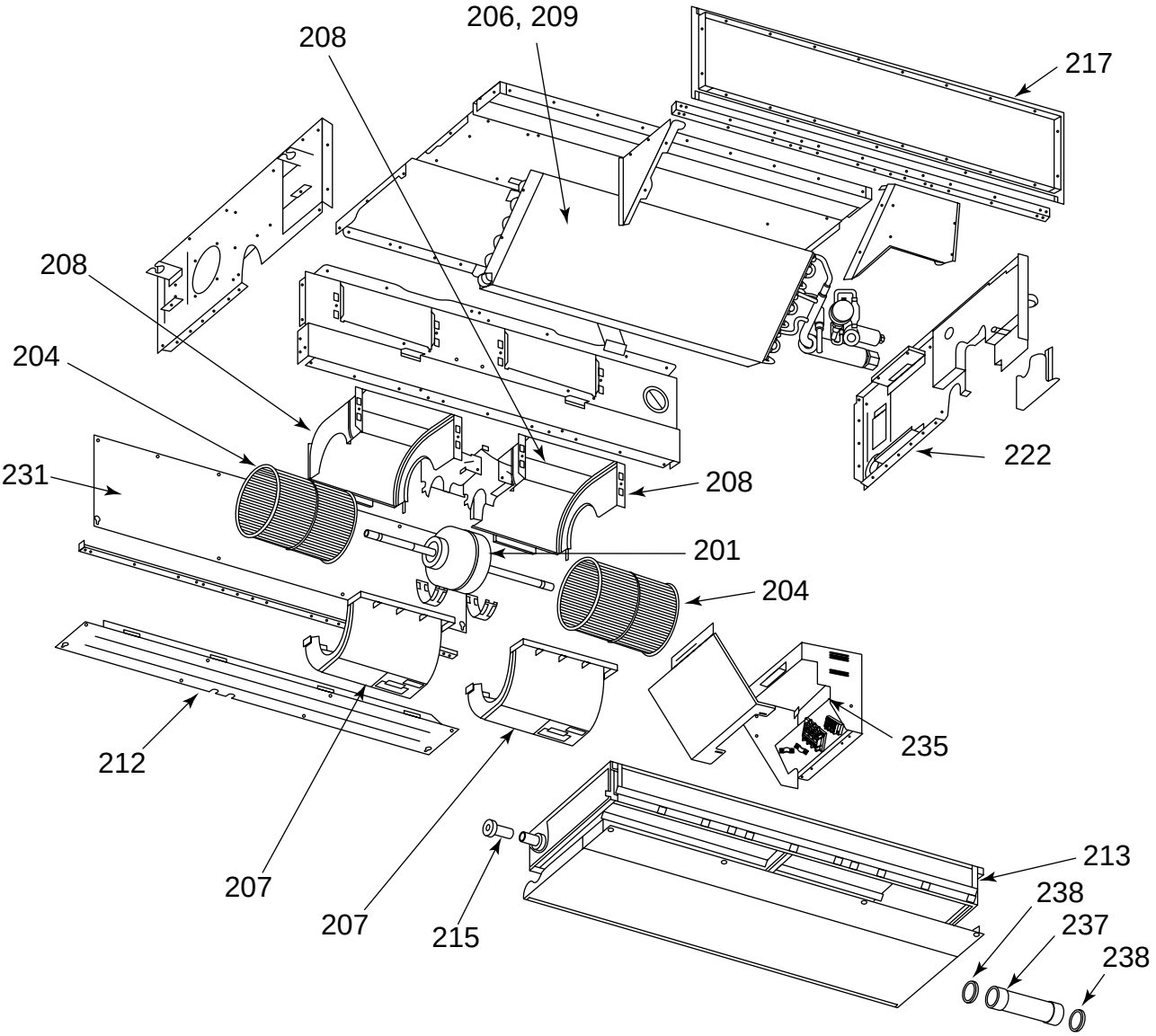


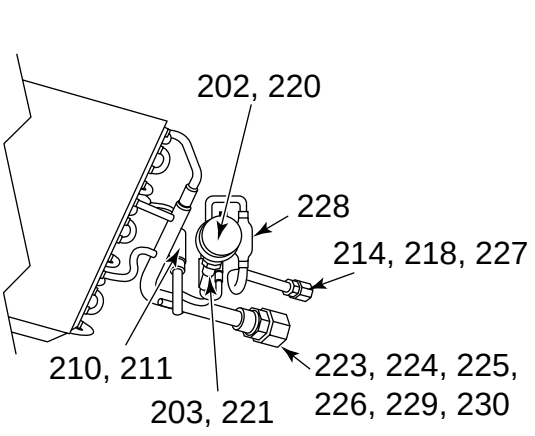


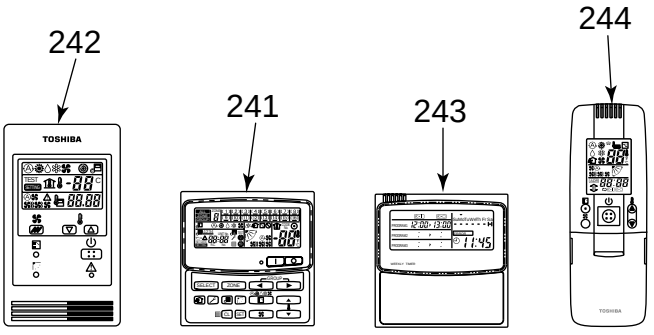
Location No.	Part	Description
201	43121715	Motor, Fan, SWF-280-60-1, 60W
202	43146555	Motor, P.M.V., EDM-MD12TF-3
203	43146677	Valve, P.M.V., EDM-B25YGTF-3 (0071SPH-C, 0091SPH-C, 0121SPH-C)
204	43120222	Fan, Multi Blade, 140DIA, 180L
205	43170232	Hose, Drain, 25A
206	4314J239	Evaporator Ass'y (0151SPH-C, 0181SPH-C)
207	43122084	Case, Fan, Lower
208	43122085	Case, Fan, Upper
209	4314J261	Evaporator Ass'y, 460L (0071SPH-C, 0091SPH-C, 0121SPH-C)
210	43146678	Distributor Ass'y (0071SPH-C, 0091SPH-C, 0121SPH-C)
211	43146679	Distributor Ass'y (0151SPH-C, 0181SPH-C)
212	43100319	Plate, Inlet-B
213	43172183	Pan Ass'y, Drain, ABS + PS-F
214	43194051	Socket
215	43179129	Cap, Drain
216	43170240	Hose, Drain
217	43100321	Flange
218	43049697	Bonnet
219	43179133	Band, Hose
220	43149314	Sheet, P.M.V.
221	43146671	Valve, P.M.V., EDM-B40YGTF-30 (0151SPH-C, 0181SPH-C)

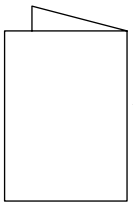
Location No.	Part	Description
222	43196109	Bushing
223	43194026	Socket (0071SPH-C, 0091SPH-C, 0121SPH-C)
224	43194080	Socket, 1/2" (0151SPH-C, 0181SPH-C)
225	43194081	Nut, Flare, 1/2, IN (0151SPH-C, 0181SPH-C)
226	43047546	Nut, Flare, 3/8, IN (0071SPH-C, 0091SPH-C, 0121SPH-C)
227	43047545	Nut, Flare, 1/4, IN
228	43147662	Strainer
229	43047609	Bonnet (0071SPH-C, 0091SPH-C, 0121SPH-C)
230	43047303	Bonnet (0151SPH-C, 0181SPH-C)
231	43100320	Plate, Inlet-A
232	43121735	Pump, Drain, ADP-1409
233	43151287	Switch, Float, FS-0218-102
234	43179126	Rubber, Pump, Drain
235	43060029	Filter, Noise
236	43079249	Band, Hose
241	4316V194	Remote Controller, SX-A3JE
242	4316V195	Remote Controller, SX-A11JE
243	4316V196	Remote Controller, EX-W2JE
244	4316V197	Remote Controller, WH-H1JE
245	4311M422	Owner's Manual, MMY-MAP1201HT8

MMD-AP0071SH-C, AP0091SH-C, AP0121SH-C, AP0151SH-C, AP0181SH-C









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222	43196109	Bushing
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235	43060029	Filter, Noise
237	43170234	Hose, Drain
238	43179130	Band, Hose
241	4316V194	Remote Controller, SX-A3JE
242	4316V195	Remote Controller, SX-A11JE
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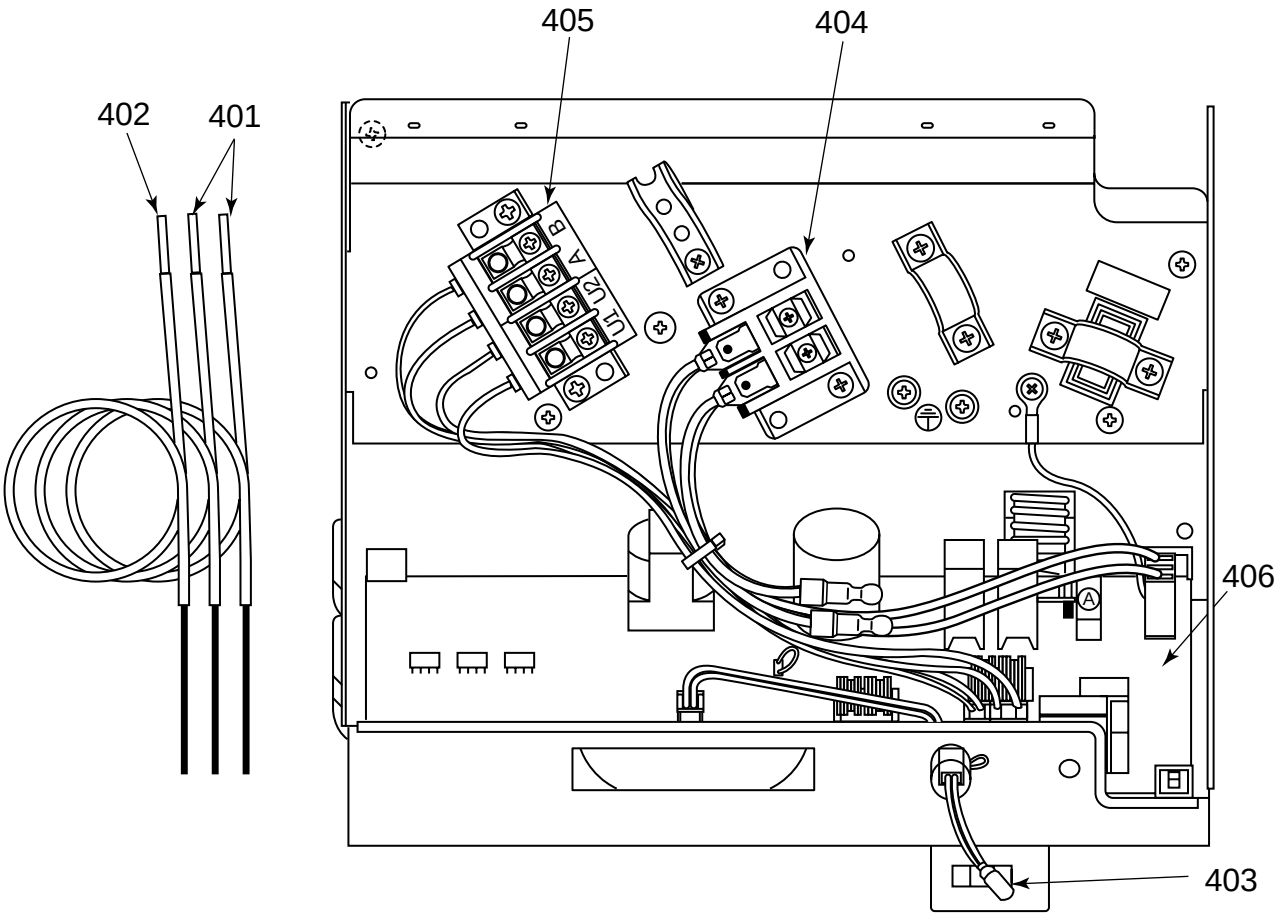
244	4316V197	Remote Controller, WH-H1JE
245	4311M422	Owner's Manual, MMY-MAP1201HT8

MMD-AP0071SPH, AP0091SPH, AP0121SPH, AP0151SPH, AP0181SPH
MMD-AP0071SPH-C, AP0091SPH-C, AP0121SPH-C, AP0151SPH-C, AP0181SPH-C
MMD-AP0071SPH-K, AP0091SPH-K, AP0121SPH-K, AP0151SPH-K, AP0181SPH-K
MMD-AP0071SH-C, AP0091SH-C, AP0121SH-C, AP0151SH-C, AP0181SH-C



Location No.	Part	Description
401	43050382	Sensor, TC (F6)
402	43050398	Sensor, TG (F4)
403	43150297	Sensor, TC

Location No.	Part	Description
404	43160478	Terminal Block
405	43160509	Terminal, 4P
406	4316V269	P.C. Board Ass'y, MCC-1402

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